LOWER MINNESOTA RIVER
WATERSHED DISTRICT

April 2024 Administrator report
From: Linda Loomis, Administrator
To: LMRWD Board of Managers

In addition to items on the meeting agenda, the following District projects and issues were addressed during the month:

Other Work

Minnesota Department of Health Fish Advisory

The LMRWD was notified that the MN Department of Health (MDH), with support from the MN DNR and MPCA, has issued a new fish consumption advisory for Mississippi River Pools 2, 3, and 4 due to elevated levels of Per- and Polyfluoroalkyl Substances (PFAS) in the fish. The guidance is for people who should avoid eating fish caught in those pools.

This area extends from Ford Dam Parkway in Saint Paul to Wabasha. MDH recommends the following guidance for all fish species in Mississippi River Pools 2-4, including all the lakes and backwaters:

- People who are or may become pregnant, people who are breastfeeding or plan to breastfeed, and children under age 15 do not eat fish from these locations.
- People not planning to become pregnant and those over age 15 limit fish consumption to one serving a month from these locations.

PFAS are a family of human-made chemicals that can, over time, build up in a person's body and pose health risks.

Since the Minnesota River is influenced by the Hastings Dam (Lock & Dam #2) and is sometimes considered part of Pool 2, I asked if the fish advisory extended to the Minnesota River. MDH said that this advisory does not include the Minnesota River.

Trout Unlimited

Trout Unlimited contacted the LMRWD to ask about monitoring work the LMRWD does in streams they are concerned about. I responded with information about the LMRWD monitoring program and directed them to the LMRWD website where annual monitoring reports can be found.

They informed me that they have an Earth Day clean-up of Eagle Creek planned, so the LMRWD will promote the event through its social media and the website.

In addition, they have been working with the DNR to trap and remove beavers and have removed many beaver dams so that the stream can flow freely.

Trunk Highway 13 Improvement Project

The LMRWD received notice from MnDOT that construction on the Trunk Highway (TH) 13 improvement project is scheduled to resume April 15, 2024. The notice is attached for the Board's information. The South Frontage Road is scheduled for closure April 17, 2024, through May 18, 2024. More information on this project can be found on the project website: https://www.scottcountymn.gov/1463/MN-13-Savage-to-Burnsville-Interchange-P

Downtown Chaska Trunk Highway 41 Improvement Project
The LMRWD received notice that construction on TH 41 would resume March 18, 2024. Improvements scheduled for 2024 can be found at the project website: https://clients.bolton-menk.com/DowntownHwy41Project/

Soil Reference Value Updates
The LMRWD received notice from the MPCA of updated Soil Reference Values (SRVs). SRVs are a screening tool that may be used to evaluate potential human health risks from exposure to contaminated soil. They are derived based on the U.S. Environmental Protection Agency's (EPA) Superfund methodology using exposure assumptions based on specific land use categories depicting a specific land use scenario and set of receptors (people).

The LMRWD is concerned with SRVs because of the LMRWD role as local sponsor to the US Army Corps of Engineers maintenance of the MN River navigation channel. The last update to SRVs was received in 2022 and the LMRWD retained Barr Engineering and Young Environmental Consulting Group to review the MPCA guidance and make recommendations to the LMRWD.

The report made to the Board at that time is attached for the Board's Information. The Board directed that staff proceed to implement the recommendations contained in the Technical Memorandum. An update to the Board of Managers will be provided at a future Board of Managers meeting.

State Agency Newsletters
State agencies periodically issue newsletters. The most recent newsletter from the MPCA can be found using this link. The most recent BSWR Snapshots can be found using this link. Managers can sign up to receive newsletters themselves. If you need assistance finding how to sign up to receive this and other information, let me know.

In addition, Minnesota Valley Refuge Friends and Hennepin County have a newsletter. Both of the most recent newsletters are attached. Managers can also sign up to receive these newsletters if you do not already receive them.

Minnesota Stormwater Seminar Series
A Stormwater Seminar is being offered in person or online on April 18, 2024 at 10am CST. Minnesota Stormwater Seminar Series is a monthly experience featuring national, state, and local experts on stormwater and green infrastructure. This seminar series is a partnership between the University of Minnesota's St. Anthony Falls Laboratory and Water Resources Center, and the Minnesota Pollution Control Agency, and made possible through the Minnesota Stormwater Research and Technology Transfer Program in collaboration with the Minnesota Stormwater Research Council.

If you would like sign up to receive notifications for future seminars you can do so through this link.

The title of this upcoming seminar is Plants for Stormwater Design, Interactive Selection Tool for Stormwater Professionals and the Public

The scheduled speakers are John Bly, Director of Operations and Special Projects at Metro Blooms; and Dan Shaw, Senior Ecologist and Vegetation Specialist with the Minnesota Board of Water and Soil Resources (BWSR).

The topic being presented is green infrastructure (rain gardens, bioinfiltration) requires choosing the correct plants for the site, soils, and situation. Join us for this seminar featuring

the results of a recently completed research project - Plants for Stormwater Design, Interactive Selection Tool for Stormwater Professionals and the Public. The project has filled a key need to develop an online resource allowing stormwater professionals to easily choose appropriate and successful native plant species for vegetated stormwater practices in different site conditions and state regions. The project has updated the Minnesota native plant search tool Blue Thumb Plant Finder to include all generally commercially available species of native plants in the state, adds information contained in the Plants for Stormwater Design reference, and pull in other available and relevant data (drought tolerance, erosion susceptibility, etc.) where possible. The tool will be linked to vegetated stormwater practice information currently being updated in the Minnesota Stormwater Manual, a comprehensive and still-growing collection of background and design information about stormwater Best Management Practices for stormwater practitioners across the state. It is also linked to a similar BWSR search tool for state seed mixes. The plant finder's database has been structured so that it can be searched with a variety of filters and tags, so that practitioners can "describe" a site that needs planting, including adverse site conditions and special parameters, and be given a detailed list of plant species that are most likely to succeed on the site. This project has been supported by the Minnesota Stormwater Research Council.

Date and Time: Thursday, April 18, 2024, 10a - 12p US Central

In-person: St. Anthony Falls Laboratory Auditorium (2 Third Ave SE, Minneapolis, MN)

Online: https://z.umn.edu/mn-stormwater-seminar-series (active 10 minutes prior)

Registration: Click here to Register

2024/2025 Watershed Based Implementation Funding (WBIF)

A convene meeting for the Lower Minnesota River Planning Area has not been scheduled. I hope to have a meeting scheduled before the LMRWD Board of Managers meeting scheduled for May 15, 2024.

56	Lower Minnesota River East	$538,396	2024
Metro	Carver County WPA	$721,325	2025
Metro	Lower Minnesota River WPA	$217,485	2025
Metro	Scott County WPA	$646,054	2025

Quality of Permit Applications

Young Environmental Consulting Group, who reviews permit applications on behalf of the LMRWD, informed me that there has been a noticeable decline in the quality of the documentation it receives with applications for LMRWD permits. Modeling is flawed, there are errors in the construction details and preparation of documents is sloppy overall.

I checked in with other Administrators in the Metro area and they too have noticed a general decline in the quality of project documentation. The sloppy applications mean that more time is being spent reviewing permit applications, and the fees charged are not even close to covering the cost of permit reviews. Other watersheds are having the same issue involving the cost to review project for permits.

The LMRWD is planning to review its fee schedule and will be asking the Board to approve an increase in application sometime in 2024.

Minneapolis approves house on Mississippi River
The Board may not be aware that when the last LMRWD Watershed Management Plan was developed, the LMRWD intended to implement the Mississippi River Critical Corridor (MRCC) standards as its standards. The State required all municipalities within the MRCC to adopt ordinance that complied with the regulations of the MCCR. Minneapolis was one of the first to revise its ordinances to comply with the regulations, however, the City is now allowing a variance to those regulations. Here is a link to the story.

As you will see in the story, the MN DNR is suing the City of Minneapolis.

MPCA – Lower Minnesota River Watershed Assessment
There is no new information to report on this item, since the last update.

Information for the previous round of assessments can be found by visiting the MPCA website using this link: Lower Minnesota River Watershed. The last assessment was completed in 2015.

Watershed Plan Projects

LMRWD Water Resource Restoration Fund: An application was received from the City of Eden Prairie. This is on the April 17, 2024, Board of Managers meeting agenda.

MAC Boundary Adjustment: Resolution 23-14 was rescinded, and Resolution 24-04 replaced it. A new petition must be signed to re-submit the petition to BWSR.

Eagle Creek Bank Restoration at Town & Country RV Facility: This project is included in the LMRWD 2024 workplan. Work has not started on this project yet.

Fen Private Land Acquisition Study: An update on the LMRWD fen work is included in the work plan update that in on the April 17, 2024, Board of Managers meeting agenda.

Spring Creek: An update on the Spring Creek bank stabilization project is included in the work plan update that is on the April 17, 2024, Board of Managers meeting agenda.
Project website: https://lowermnriverwd.org/projects/spring-creek

Gully Inventory and Assessment: An update on the LMRWD gully inventory and assessment is included in the work plan update that in on the April 17, 2024, Board of Managers meeting agenda.
Project website: https://lowermnriverwd.org/projects/mn-river-corridor-management-project

Minnesota River Study Area #3: An update on the Minnesota River Study Area #3 is included in the work plan update that is on the April 17, 2024, Board of Managers meeting agenda.
Project website: https://lowermnriverwd.org/projects/study-area-3-eden-prairie

Minnesota River Floodplain Modeling: An update on the Minnesota River Floodplain Modeling is included in the work plan update that is on the April 17, 2024, Board of Managers meeting agenda.

Vernon Avenue Dredge Material Management: An update on this project is on the April 17, 2024, LMRWD Board of Managers meeting agenda.

Geomorphic Assessments (Trout Streams): An update on the Geomorphic assessment of Trout Streams is included in the work plan update that is on the April 17, 2024, Board of Managers meeting agenda.

The following projects are projects that are planned by LMRWD partners. LMRWD partners are leading these projects, the LMRWD has agreed to contribute to the projects:

Seminary Fen Ravine Restoration Area C2: An update on this item is provided above.
Here is a link to the feasibility report Area C-2.

Shakopee Riverbank Stabilization: The City of Shakopee has introduced legislation for additional funding for this project.

Project website: https://www.shakopeemn.gov/living-here/street-infrastructure-projects/minnesota-riverbank-stabilization

Carver Levee: The City of Carver has introduced legislation for additional funding for this project.
Project website: https://www.cityofcarver.com/276/Levee-Certification

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Upcoming meetings/events

Managers are invited to attend any of these meetings. Most are free of charge and if not the LMRWD will reimburse registration fees. Please contact LMRWD administrator if you have any questions.

- Metro Watershed – Tuesday, April 16, 2024, 7:00 pm to 9:00 pm, Capitol Region Watershed District, 595 Aldine Street, St. Paul, MN 55104
- ~~Lower MN River East 1W1P Advisory Committee meeting – April 17, 2024, 10:00 am to 1:00 pm, Scott SWCD office, 7151 W 190th St, Jordan, Minnesota 55352~~ CANCELLED
- Lower MN River East 1W1P Steering Committee meeting – Wednesday, April 17, 2024, 10:00 pm to 3:00 pm – virtual only on MS Teams
- ~~Lower MN River East 1W1P Policy Committee – Thursday, April 18, 2024, 3:00 pm to 5:00 pm, In-person at Le Sueur SWCD office located at 181 W Minnesota St, Le Center, MN 56057 and virtual on MS Teams~~ CANCELLED
- UMWA (Upper Mississippi Waterway Association) monthly meeting – Thursday, April 18, 2024, virtual only via Zoom
- ~~Public Hearing for Lower Minnesota River East 1W1P – Monday, April 29, 2024. 4:00 to 7:00 pm, Giesenbrau Bier Co., 1306 1st Street NE, New Prague, MN 56071~~ RESCHEDULED date TBD
- River Resource Forum – Tuesday, April 30, 2024, 9:00 am to 4:00 pm Minnesota Marine Art Museum, 800 Riverview Dr., Winona, MN 55987 and virtual on WebEx
- LMRWD Citizen Advisory Committee meeting – Tuesday, May 7, 2024, 4:30pm,
- Lower MN River East 1W1P Policy Committee meeting – Thursday, May 16, 2024, 3:00 pm to 5:00 pm, in-person at Le Sueur County SWCD office located at 181 W. Minnesota St. Le Center, MN 56056

Metro – Hwy 13 in Savage and Burnsville: 2022-2024 construction

Hwy 13 work resumes on April 15

Work on the Hwy 13 and Dakota Ave. intersection project resumes Mon, April 15 and is expected to wrap up by Memorial Day, May 27.

Throughout the remainder of construction, motorists can expect minimal travel impact on Hwy 13.

Beginning at 7 a.m. Mon, April 15, crews plan to begin removing the U-turn under the Hwy 13/Hwy 101 bridge. Motorists can expect shoulder closures, flaggers may slow down and control traffic at on- and off-ramps during off-peak hours, and nighttime ramp closures are also possible during this time.

Flaggers will also be used when crews pave 126th St.

South Frontage Road closure April 22-May 24

Then, beginning at 6 a.m. Mon, April 22, crews plan to close South Frontage Rd. in both directions between Louisiana Ave. and Dakota Ave. through Fri, May 24. This closure is necessary while crews complete pavement and sidewalk work.

Finally, the contractor will also complete the trail under the Dakota Ave. bridge and finish landscaping and clean up the project area.

We appreciate your patience while we make these improvements. Plan ahead by checking 511, and give yourself additional time to reach your destination.

All construction activities and traffic impacts are weather and schedule permitting and subject to change.

Please drive with care in work zones:

- Slow down when approaching every work zone, then navigate with care and caution.
- Stay alert; work zones constantly change.
- Watch for workers and slow-moving equipment.
- Obey posted speed limits. The fine for a violation in a work zone is $300.
- Minimize distractions behind the wheel.
- Be patient; expect delays, especially during peak travel times.

More about this project

We are reconstructing the Hwy 13 and Dakota Ave. intersection in Savage. Crews have built a new Hwy 13 bridge over Dakota Ave., as well as access ramps, to reduce traffic backups and improve safety. The Dakota Ave. interchange construction project area includes Hwy 13 between the Hwy 13/Hwy 101 interchange and Quentin Ave.

For more information, visit the Hwy 13 project webpage. If you have questions, please contact the project team.

MnDOT invites and encourages participation by all people in their programs, services and activities.

If you need an ASL, a foreign language interpreter, or documents in an alternative format (such as braille, large print or in a different language) at no cost, please email your request to Janet Miller at ADArequest.dot@state.mn.us or call 651-366-4720. Relay service: 711.

If you need any other reasonable accommodation to participate (such as seating modification or auxiliary aids), please email your request to Accessibility.DOT@state.mn.us or call 1-833-400-8432. Relay service: 711.

Young Environmental Consulting Group, LLC

Technical Memorandum

To: Linda Loomis, Administrator
Lower Minnesota River Watershed District

From: Katy Thompson, PE, CFM
Hannah LeClaire, PE

Date: October 12, 2022

Re: Revised Soil Reference Values and the Dredge Material Management Plan

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As outlined in the Lower Minnesota River Watershed District's (LMRWD's) workplan to the Board of Water and Soil Resources, the LMRWD will implement capital improvement projects and continue the operation and management (O&M) of the Cargill East River (MN—14.2 RMP) Dredge Material Site (Site) located on the Minnesota River in Savage, Minnesota (Figure 1). O&M activities include maintenance of the Site and management of the disposal of the dredged material.

The Minnesota Pollution Control Agency (MPCA) has been in the process of updating its Soil Reference Values (SRVs), which are used as a screening tool to evaluate potential human health risks from exposure to contaminated soil, since 2014 and has recently updated the values in 2021 and 2022. This document provides the history of the dredging activities on the Minnesota River, reviews the impacts of the new SRVs on the LMRWD's current dredged material management, and provides recommendations for updating the LMRWD's Dredged Material Management Plan (DMMP).

Background

The U.S. Army Corps of Engineers (USACE) is required to maintain a nine-foot-deep by 100-foot-wide channel within the Minnesota River for barge navigation from its confluence with the Mississippi River to 14.7 miles upstream. While the USACE provides the needed channel dredging for navigation, the LMRWD serves as the local sponsor and is responsible for providing dredge material placement sites and disposal. In 2007, the LMRWD acquired land from Cargill, and in 2014, it entered into an

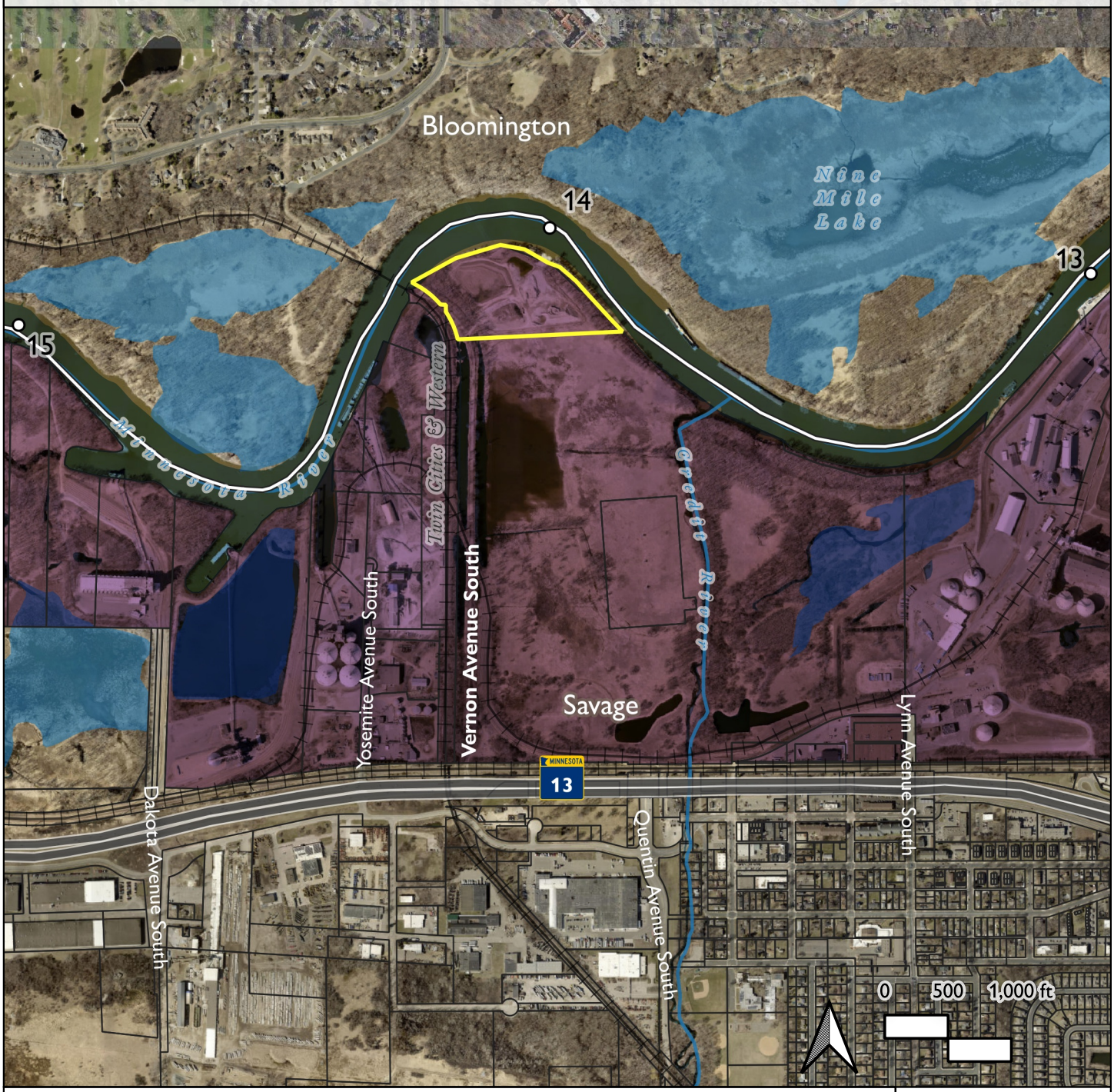
agreement with LS Marine, which also provides dredging services for the private slips at the nearby Ports of Savage, to operate the Site and identify end users for the USACE dredged material on the LMRWD's behalf. In 2020, the Site was improved to reconfigure the containment berms to segregate the sandy USACE dredged material and the more fine-grained and clayey private dredged material, which requires longer drying times. Since this most recent construction was completed, LS Marine has coordinated the placement and removal of approximately 24,000 cubic yards (CY) of USACE dredged material and 93,000 CY of private dredged materials.

LMRWD's role and responsibilities for dredged material are outlined in the District's *2018–2027 Watershed Management Plan* and its *Cargill East River (MN—14.2 RMP) Dredge Material Site Management Plan* (DMMP) adopted in January 2013. The DMMP included sediment analysis to determine the beneficial reuses available for the dredged material, considering contaminant-specific concentrations from the SRVs. In 2009, samples were screened against the SRVs and determined to be below the MPCA Dredge Material Level 1 values and suitable for residential fill uses around potentially sensitive populations, such as the very young, infirm, and elderly. Contamination below the Level 1 values is considered to represent little to no risk for human exposure (Table 1).

Table 1. 2009 Sediment Analysis and MPCA SRVs from the 2013 DMMP

	2009 Sample	Level 1 SRV (Residential)	Level 2 SRV (Industrial)
Arsenic (mg/kg dry)	2.3	9	20
Cadmium (mg/kg dry)	<0.52	25	200
Chromium Total (mg/kg dry)	5.5	87	650
Copper (mg/kg dry)	2.6	100	9,000
Lead (mg/kg dry)	3.4	300	700
Mercury (mg/kg dry)	<0.018	0.5	1.5
Nickel (mg/kg dry)	5.3	560	2,500
Selenium (mg/kg dry)	<1.0	160	1,300
Zinc (mg/kg dry)	15	8,700	75,000
Total PCBs (mg/kg dry)	<0.11	1.2	8.0

Figure 1: LMRWD Dredge Site Location Map



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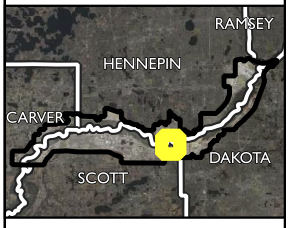
- LMRWD Dredge Site
- LMRWD Boundary
- River Mile Markers
- Public Waterways
- Public Waterbodies
- Major Highways
- Railroads
- Scott Co. Parcels
- Ports of Savage Industrial District
- County Boundaries

LMRWD Location



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In 2014, the MPCA developed two reference documents for managing dredged materials: *BMPs for the Management of Dredged Materials* and *Managing Dredged Materials in Minnesota*. These documents superseded the SRV values used in 2009 and provide clearer guidance on how and where dredged materials may be used depending on their chemical composition. In 2021 and 2022, *Managing Dredged Materials in Minnesota* was further updated and expanded to include 21 additional metals and chemicals, notably perfluoroalkyl and polyfluoroalkyl substances, commonly known as PFAS, which are an emerging contaminant of concern for groundwater.

A review of the USACE annual dredging summaries available online as part of its *Channel Maintenance Management Plan* (CMMP) provided the quantities of material dredged from each Minnesota River historic dredge cuts (or reaches) from 1970 through 2020 (Table 2, Figure 2). The estimated volumes to be dredged for 2022 are also included in Table 2. From the USACE data, we were able to determine the percentage of routine and nonroutine dredging activities contributing to the total quantity dredged, as well as the average accumulation rate, in terms of CY per year (yr).

Table 2. Summary of USACE Dredged Quantities, 1970–2022 (CMMP Table 14)

Reach	Number of Times Dredged	Last Date Dredged	Total Quantity Dredged (CY)	% of Routine Dredging Activities	Avg. Accumulation Rate (CY/yr)
MN-1	2	1993	32,234	89%	1,470
MN-2	1	1987	4,389	100%	-
MN-3A	1	1983	36,612	100%	-
MN-3B	2	1982	14,454	100%	1,610
MN-3C	37	2022	611,038	47%	11,980
MN-4	13	2022	39,370	51%	1,640
MN-5	20	2017	261,578	78%	5,940

Next we compared the USACE dredge records from 1999 to 2022 to the 27-year forecasted quantities from 1999 through 2025 in the 2013 DMMP (Table 3). Cells that exceed the forecasted quantities are highlighted in yellow, while cells the are less than for forecasted quantities are highlighted in green.

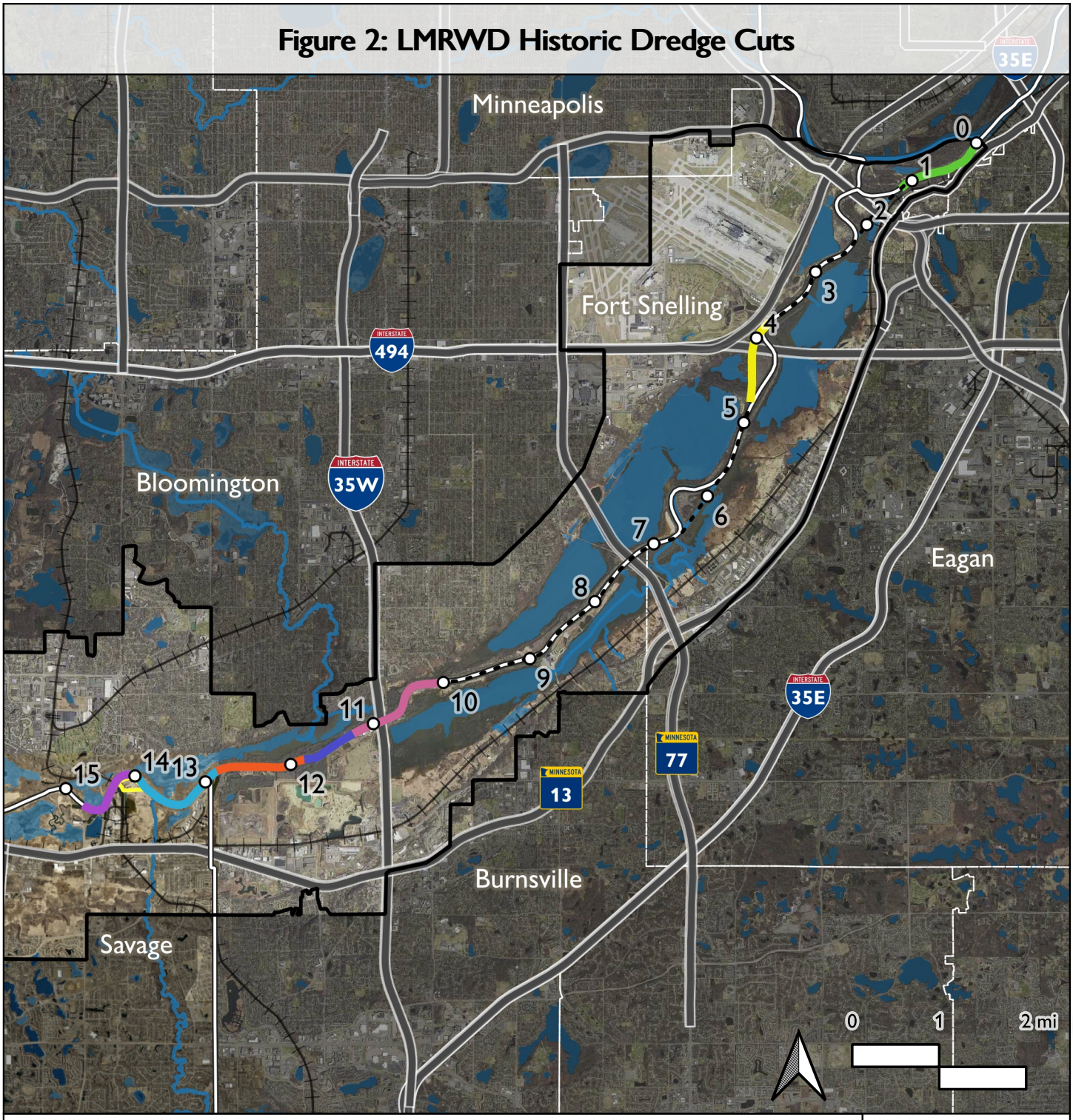
Table 3. DMMP 27-year Forecasted Dredging Quantities (1999–2025) versus USACE Dredge Records (1999–2022)

Reach	27-yr Forecasted Number of Dredge Events	27-yr Forecasted Dredged Quantity (CY)	27-yr Forecasted Accumulation Rate (CY/yr)	USACE Number of Dredge Events, 1999–2022	USACE Dredged Quantity, 1999–2022 (CY)	Avg. Accumulation Rate, 1999-2022 (CY/yr)
MN-1	3	54,000	2,000	0	0	0
MN-2	3	27,000	1,000	0	0	0
MN-3	15	405,000	15,000	19	320,484	13,400
MN-4	3	237,600	8,800	12	35,872	1,500
MN-5	8	432,800	16,030	10	89,698	3,700
TOTAL	**85**	**1,156,400**	**42,830**	**41**	**446,054**	**18,600**

The overall analysis of the forecasted DMMP quantities and USACE dredge records shows that the total annual volume dredged has averaged around 18,600 CY, more than 24,000 CY less than the 2013 DMMP forecasted annual total of 42,830 CY. The two-year running average of the total annual dredged volume (Figure 3) appears to support this lower annual average since the 1990s. The dredged volumes by reach shown in Figure 3 also confirms that over the past 52 years, the most frequently dredged reaches of the Minnesota River were MN-3C, MN-4, and MN-5. Updates to the DMMP should include a review of all historic dredge cuts to update the forecasted quantities for the next 30-year period (2022–2052) and confirm the LMRWD Dredge Site will have adequate storage capacity into the future. This update should also include a review of the forecasted operating costs, especially if the forecasted annual dredge quantities are less than the 2013 DMMP estimates, as this may affect the potential beneficial uses and income generated from the sale of dredge spoils.

Figure 3 includes historic flood events for reference however a brief review of flood and drought records (Figure 4) does not appear to show a correlation between dredged volumes and episodic river events. The impact of weather extremes on dredging operations should be further investigated with any update to the DMMP so that the LMRWD can plan accordingly for the future.

Figure 2: LMRWD Historic Dredge Cuts



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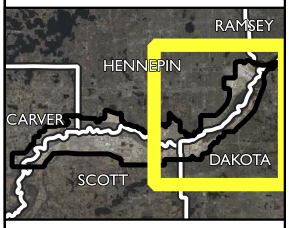
USACE Historic Cuts

- MN-1: Mouth of MN River
- MN-2: 4Mile Cut-Off
- MN-3A: Above 35W Bridge
- MN-3B: Below Peterson's Bar
- MN-3C: Peterson's Bar
- MN-4: Cargill Slip
- MN-5: Above Savage RR Bridge

- Not Routinely Dredged
- River Mile Markers
- LMRWD Dredge Site
- LMRWD Boundary
- Public Waters
- Major Highways
- Railroads
- County Boundaries

LMRWD Location



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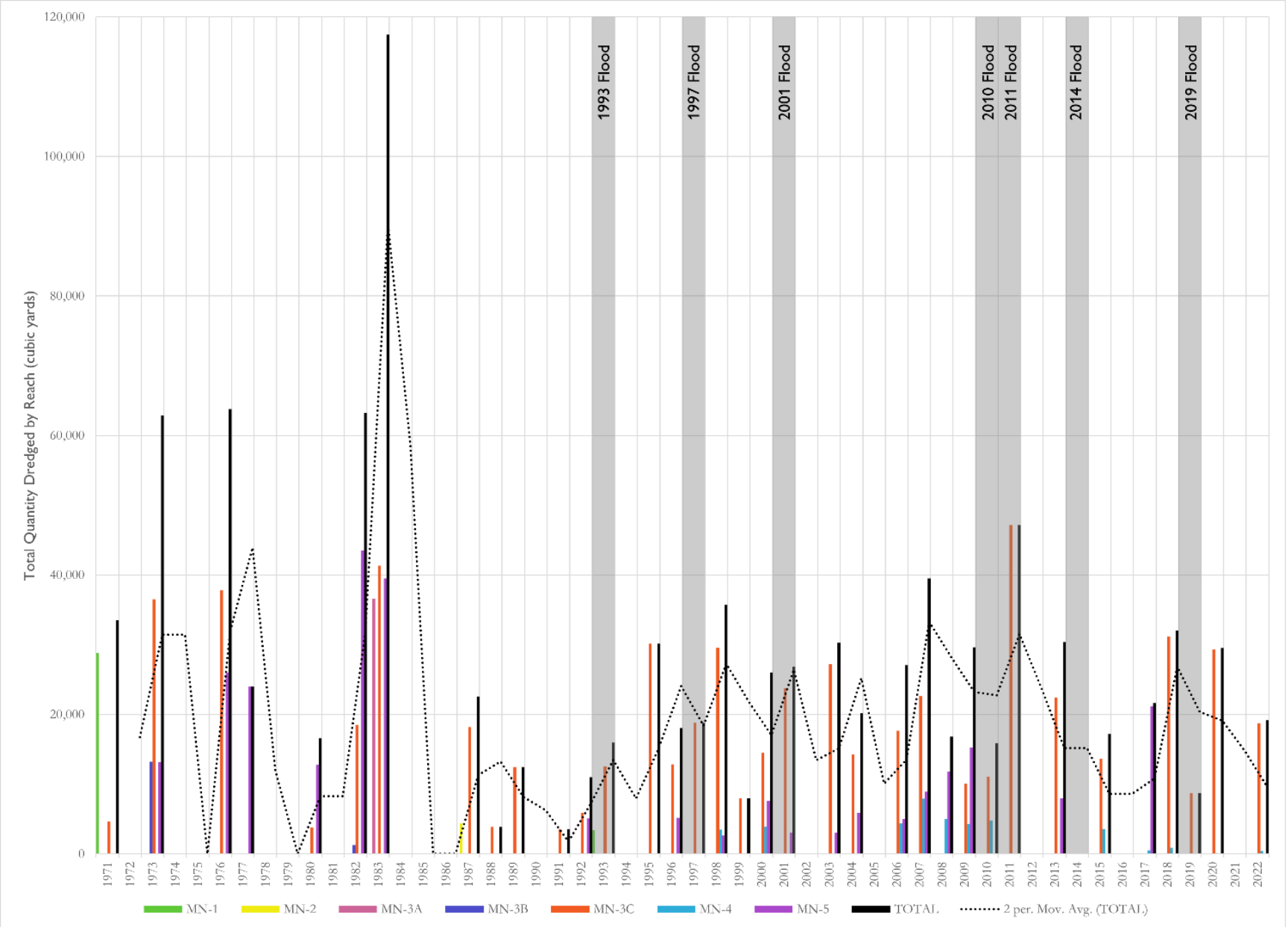

Figure 3. Annual Material Dredged per USACE Minnesota River Reach (USACE 2020); Black dashed line indicates the total dredged volume two-year running average.

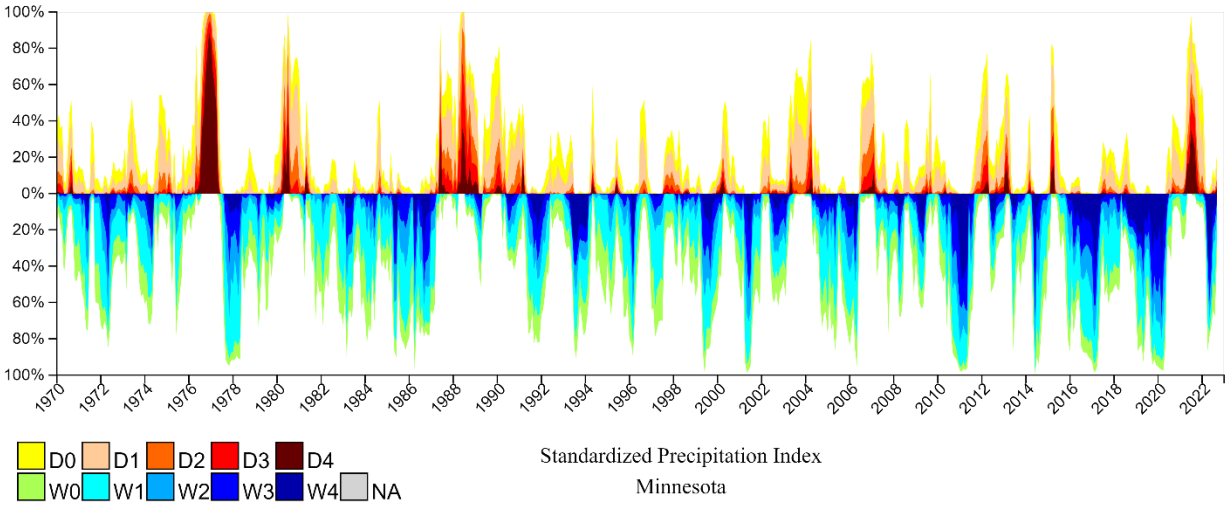

Figure 4. Standardized Precipitation Index from Drought.gov (D0–D4 indicate drought severity, whereas W0–W4 indicate wet conditions over a nine-month average.

Impacts to LMRWD Operations

The LMRWD authorized Barr Engineering Co (Barr) to review the latest SRV values and provide an assessment of the changes and impacts to LMRWD activities and operations (Attachment 1). Barr reviewed the historic sampling data from the USACE CMMP and LMLRWD DMMP and identified that the only chemical parameter that would have exceeded the 2022 MCPA Level 1 SRV was manganese. The manganese Level 1 SRV decreased from 3,600 mg/kg in 2009 to 730 in 2022, and the historic Minnesota River samples show manganese concentrations between 56.8 and 931 mg/kg. The highest concentration was found at River Mile (RM) 14.5 (MN-5, Figure 2), whereas the lowest was at RM 13.2 (MN-4, Figure 2). Barr concluded in their analysis that manganese concentrations in the Minnesota River "are consistent with naturally-occurring background levels in the soil and may be due to the geochemical composition of the sediments themselves." Regardless, the lowered manganese SRV may limit the ability to sell dredged materials to the private market and could significantly increase the LMRWD's operation costs if dredged material is required to be landfilled rather than sold. Future updates to the DMMP should validate the levels of manganese that could be expected to be found in the dredge spoils from each reach because the historic data shows MN-5 only exceeded the 2022 SRV the single time in 1999.

Though there does not appear to be an immediate requirement for the LMRWD Dredge Site to address PFAS, it could be a requirement in the future should PFAS be found in the dredge material. Barr preliminary identified potential sources of PFAS in the watershed, including airports, landfills, and wastewater treatment plants that may have

historically “used, discharged, emitted, and/or served as conduits for PFAS.” Barr noted that while there is no statewide value for PFAS in surface water, it is expected that there will be decreasing tolerance for PFAS in surface and groundwater in the future. Also, given the presence of PFAS found in Pool 2 of the Mississippi River, Barr anticipates that the new PFAS SRVs will eventually affect the dredge material management, which may further limit the ability to sell the dredged material.

Next Steps

The District DMMP was last updated in 2013 and focuses heavily on material placement options, beneficial uses, and estimated quantities through 2025. Given the changes in SRV values and river conditions, we recommend the DMMP be updated to plan for future management of the site, including contingency plans for if dredge materials exceed the manganese and PFAS criteria. The following are specific items that should be considered as part of the DMMP update:

1. Complete a sediment assessment to aid in forecasting the next 30-years of dredging requirements for the Minnesota River, considering changing climate and flow conditions as well as projected changes in barge traffic or dredging practices.
2. Collect sediment core samples at each of the Minnesota River dredge cuts to supplement the data last collected in 2009 and validate the ability to continue sales of dredged materials, if not already available from the USACE or LS Marine.
3. Review the MPCA PFAS Monitoring Plan and identify future improvements necessary for the LMRWD Dredge Site to prevent runoff and soil leaching of PFAS, should PFAS be found in dredged materials.
4. Meet with the USACE to discuss the Mississippi River Pool 2 dredged material management for PFAS and identify joint disposal opportunities should the Minnesota River dredge material exceed the SRVs for PFAS in the future.
5. Develop an adaptable framework for the next 30-years of dredge site management based on the results from items 1 and 2 above and including alternative options for disposal of dredged material should the sediments exceed current SRV thresholds.

Attachments

Attachment 1—Lower Minnesota River Watershed District Soil Criteria Review Technical Memorandum by Barr Engineering, dated August 25, 2022

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engineering and environmental consultants

BARR

Technical Memorandum

To: Della Young, Young Environmental Consulting Group
From: Jenni Brekken
Subject: MPCA Soil Criteria Review for LMRWD
Date: August 25, 2022
Project: Lower Minnesota River Watershed District Soil Criteria Review
c: Karen Chandler

The Lower Minnesota River Watershed District (LMRWD) manages dredged sediments from the Minnesota River and from other ponds or surface waters. As part of this activity, an evaluation of the material is needed to determine the appropriate disposal or reuse of the materials based on Minnesota Best Management Practices (BMP) documents and other federal, state or local regulations. Assessment of chemical contamination in dredged sediments is part of the BMPs and impacts whether the material may be reused as fill, may have a restricted reuse, or requires landfill disposal. For this assessment, sediment chemical concentrations are compared to current Minnesota Pollution Control Agency (MPCA) Soil Reference Values (SRVs). The MPCA recently provided a substantive update to their methods for developing SRVs in 2021 and in May 2022 followed with an annual update to their SRVs (MPCA, 2021 and 2022a/b).

The MPCA also recently issued a per-and polyfluoroalkyl substances (PFAS) Monitoring Plan, outlining specific programs and facilities that will incorporate analysis for PFAS as part of the regulatory program. The MPCA's PFAS monitoring programs may also impact decisions regarding reuse of dredged sediments.

This memo describes how the SRVs are typically used in evaluating dredge materials, summarizes the recent SRV updates (in 2021 and 2022), and provides an assessment of how these changes may impact LMRWD activities or operations. In addition, Barr is providing a review of the MPCA PFAS Monitoring Plan including a discussion of whether PFAS analysis of sediments may be required and the potential impacts to LMRWD.

1 Soil Reference Values Overview

The SRVs are a screening tool used to evaluate potential human health risks from exposure to contaminated soils by comparing chemical concentrations in soil to the SRVs. They are derived using USEPA methodology for assessing human health risk and are based on conservative assumptions designed to be protective of the most vulnerable receptors and cover multiple soil exposure pathways, including inhalation of dust, ingestion, dermal contact and inhalation of vapors for both cancer and non-cancer risks. SRVs are developed using exposure assumptions based on different land use categories (e.g., the assumed duration and quantity of exposure to the soil is different for a residential use property versus

an industrial use property). Currently, the MPCA has published SRVs for two different land use categories: 1) residential/recreational (e.g., single family homes; multi-family housing; long-term care facilities, hospitals, churches, schools, sports fields, etc.) and 2) commercial/industrial (warehouses, offices, manufacturing facility, restaurants, hotels, etc.)

The MPCA has several programs where SRVs are applied, including brownfields, petroleum leak sites, closed landfills, superfund, management of dredged sediments, management of stormwater pond sediments, and for evaluating offsite reuse of excess fill from a development or construction project. For evaluating whether dredged sediments or soils are suitable for reuse on other sites, the residential/recreations SRVs (formerly referred to as "Tier 1" SRVs), are applied, which are lower and more conservative than commercial/industrial SRVs.

The SRVs are provided by the MPCA in an excel spreadsheet format (https://www.pca.state.mn.us/document/c-r1-06xlsx), which includes detailed background information on how each SRV is calculated and the final SRVs for each chemical. This spreadsheet is updated periodically by the MPCA and the revision year for each chemical is noted within the spreadsheet.

2 Applications of SRVs to LMRWD Projects

The following types of projects or activities undertaken by LMRWD may warrant evaluation of chemical concentrations in soils or sediments using MPCA SRVs:

- Stormwater management or flood mitigation projects involving excavation in areas with contaminated soils or sediments.
- Creek or riverbank erosion control or bank stabilization projects in areas with contaminated soils.
- Management of dredge material from the Minnesota River.

2.1 Soil Excavation Projects

For projects involving excavation of soils, if there is no known or suspected source of contamination, sampling and analysis of this excess soil is generally not needed. During the planning stages of an excavation project, an initial assessment can be considered to help determine whether an investigation and chemical analysis of the soils may be warranted. Depending on the site specifics, the initial assessment could involve a desktop review of the site history and uses such as review of MPCA's website What's in My Neighborhood (MPCA, 2022f) and any available historical aerial imagery. If a property transfer is occurring as part of the project, or if there are potential concerns for environmental releases, then more detailed study could be completed that would involve completion of a Phase I Environmental Site Assessment (ASTM, 2021) that includes broader records review, interviews, a site visit, and a preparation of a report.

If there is documented contamination or recognized environmental conditions indicating contamination is likely present in the soils, soil sampling and chemical analysis can be performed, and the results compared to SRVs. The list of chemical contaminants is selected based on the land use history and suspected type of hazardous substance or petroleum release. In the case where contamination is identified at concentrations above MPCA SRVs for a particular land use, plans for appropriately managing and/or disposing of soils

are needed. These projects may be performed under the MPCA's voluntary remediation (Brownfield) program oversight to obtain various MPCA liability assurances or technical review of reports and cleanup plans (MPCA, 2022c).

Offsite reuse of soil is guided by MPCA's Best Management Practices (BMP) for the Off-Site Reuse of Unregulated Fill (MPCA, 2012a) and the BMP for Off-Site Reuse of Regulated Fill (MPCA, 2012b). The classification of Unregulated Fill includes soils that meet MPCA Soil Leaching Values (SLVs; protective of contaminant leaching to groundwater), MPCA Residential SRVs, and are free of debris and other observations of contamination (MPCA, 2012a). Regulated Fill is defined as soil that has chemical concentrations above MPCA residential SRVs but below Industrial SRVs (among other characteristics). However, the BMP for Offsite Reuse of Regulated Fill (MPCA, 2012b) requires identification of a project site to receive the Regulated Fill and approval by local government and MPCA. Because of these restrictions, reuse of Regulated Fill under MPCA's BMP is rare. In most cases, excess soils with chemical concentrations above MPCA residential SRVs are typically disposed of at a landfill.

2.2 Stormwater Pond Dredging Projects

For management of sediments removed from stormwater ponds, work is guided by MPCA's BMP for Managing Stormwater Sediments (MPCA, 2017), typically independent of voluntary brownfield cleanup program review.

Similar to excavated soils, offsite reuse of sediments dredged from stormwater ponds (MPCA, 2017) is based on whether the sediment chemical concentrations meet MPCA's BMP for Unregulated Fill (MPCA, 2012a), which includes residential SRVs and SLVs. The stormwater pond sediment chemical parameter list for laboratory analysis includes analysis of polycyclic aromatic hydrocarbons (PAHs), arsenic and copper, and any other chemicals that would be expected to be present in the sediments based on a known release or site use (e.g., from industrial operations on the site). The same site assessment tools outlined in Section 2.1 could be used to evaluate historical site uses and potential for contamination. Stormwater pond sediments that do not meet Unregulated Fill guidelines are typically drained of free-liquids and disposed at a solid waste landfill.

2.3 River Dredge Material Management

The LMRWD manages Minnesota River sediments dredged by the US Army Corps of Engineers (USACE) to maintain the Minnesota River 9-foot navigation channel from the confluence of the Mississippi River to river mile 14.7 in Savage, Minnesota (LMRWD, 2013). The dredged sediments are stored at the Cargill East River site, located at river mile 14.2 in Shakopee, Minnesota (LMWRD Dredge Facility). The LMRWD Dredge Facility is estimated to potentially store about 190,000 CY of dredged material at one time An estimated 25,000 CY of sandy material is dredged annually by the USACE and managed at the LMRWD Dredge Facility. The USACE dredged material is dewatered prior to being taken offsite for beneficial reuse. Approximately 18,000 CY of mainly fine grained silty and clay sediments dredged from private terminals in this stretch of the river are also dewatered and managed at the LMRWD Dredge Facility for a fee prior to being taken offsite within the year (Burns & McDonnell and Young Environmental, 2017).

As one of the LMRWD's main activities is to manage dredge materials from the Minnesota River, the remainder of this memo focuses on dredge material management.

3 Minnesota Dredge Material Management BMPs

The MPCA has two relevant guidance documents for managing dredge materials: 1) BMPs for the Management of Dredged Material (MPCA, 2014a) and 2) Managing Dredge Materials in Minnesota (MPCA, 2014b). The guidance indicates the following steps for determining the appropriate management method for dredged materials: perform grain size analysis, evaluate past industrial activities and sources of pollutants, and collect samples for analysis of pollutants likely to be present. If the grain size analysis indicates the material is predominantly sand (only 7 percent is finer than sand and passes the #200 sieve), the material is deemed by the guidance to be unlikely to contain contaminants and does not need chemical analysis. USACE dredge materials from the Minnesota River were previously reported to be predominantly sand (7 percent or less fines) with an average of 1 to 4% silt and clays (USACE, 2007), indicating the material and does not warrant chemical analysis based on the Minnesota BMP (MPCA, 2014a/b). The USACE also reported that materials from private dredging typically tested as having 30% silts and clays, which would warrant chemical analysis (USACE, 2007). Barr did not evaluate grain size data sets from the Minnesota River for this assessment, so we assume for the purposes of this memo that dredge materials are tested for chemical analyses as part of the LMRWD dredge material management plans.

Management of dredge materials originating from the Minnesota River downstream of River Mile 27 (which is approximately two miles upstream of the CSAH 101 crossing at Shakopee) requires a permit under the State Disposal System for disposal or reuse of dredged materials (MPCA, 2014b) if the quantity of dredged material is 3,000 cubic yards or more (MPCA, 2014b).

The Dredge Material BMP defines the following management categories for sediment based on chemical concentrations (MPCA, 2014b):

- Level 1 Dredged Material is suitable for reuse on residential or recreational properties and is characterized as being at or below analyte concentrations for all of the Tier 1 SRVs (a.k.a. Residential/Recreational SRVs).
- Level 2 Dredged Material is suitable for use or reuse on properties with an industrial use category and is characterized as being at or below analyte concentrations for Tier 2 SRVs (a.k.a. commercial/industrial SRVs).
- Level 3 Dredged Material is not suitable for use or reuse and is classified as having one or more analyte concentrations being greater than Tier 2 (commercial/industrial) SRVs.

Dredged material, if not excluded from additional analysis as determined using the grain size analysis described above, is to be analyzed for a baseline list of sediment parameters as well as other pollutants with a reasonable likelihood to be present in the dredged material based on an evaluation of past

industrial activities. The lists of baseline sediment parameters and additional sediment parameters for which the MPCA has established SRVs is shown on Table 1.

4 SRV Updates

The SRVs established in 2009 were applied for many years, with only minor updates or additions as information developed regarding toxicity for select, limited chemicals. In 2014, MPCA published draft revised methodology and SRVs for public comment. Several iterations of draft SRVs were provided and new SRVs and technical guidance were finalized and published in January 2021. Updates to the MPCA SRVs and associated technical guidance occurred in 2022

The changes in the SRVs, comparing 2009, 2021 and 2022 values are shown in Table 1 (residential/recreational SRVs) and Table 2 (commercial/industrial SRVs) for those chemicals on the sediment parameter lists for dredge materials (MPCA, 2014b). PFAS, while not on the sediment list, are also included, and discussed further below. In general, most of the residential SRVs decreased from 2009 to 2021 due to changes in toxicity information, assumptions and default values used for the risk-based calculations of these screening levels. Fewer SRVs decreased for the industrial/commercial land use, and some, including naphthalene, benzo(a)pyrene equivalents and copper increased significantly from 2009 to 2022. Between 2021 and 2022, fewer SRVs changed, but those that did decreased.

Notable changes to the SRVs and technical guidance in 2021 and 2022 include the following:

- Prior to 2021, individual SRVs were published for these four land use scenarios: residential, recreational, industrial, and short-term worker. In 2020, the categories were reduced to two: residential/recreational and commercial/industrial. The MPCA updated their SRVs and technical guidance again in 2022 and has indicated they plan to provide annual updates to the SRVs.
- Calculation of some SRVs based on the risk-based equations resulted in very low values, below either naturally-occurring levels (e.g. arsenic) or typical urban anthropogenic background levels (e.g. benzo(a)pyrene) in soil. For these chemicals, the SRVs were set at the background levels, as MPCA has recognized that cleaning up soil to levels below background concentrations is not feasible or practicable. It should be noted that some background concentrations in soil are also higher than SLVs (especially for metals); use of SLVs to assess contaminant levels should also consider background concentrations in decision-making.
- Previous SRVs accounted for both acute (short term) and chronic (long term) exposures. The 2021 revision separated acute from chronic SRVs for the residential exposure scenario for chemicals with acute toxicity risk. For the sediment parameter list, these include arsenic, barium, cadmium, copper, cyanide and nickel. It should be noted that the acute SRVs for barium and copper are more than an order of magnitude lower than the chronic SRVs.
- The technical guidance for assessing risk from carcinogenic PAHs (cPAHs) is assessed by calculating a toxic equivalency to benzo(a)pyrene. There are different cPAH parameter lists published for sediments than there are for soils, but after the 2021 update, both the MPCA soil and sediment guidance documents indicate the benzo(a)pyrene equivalents are to be calculated

using Kaplan Meier statistical methods. When analyzing for PAHs, the correct parameter list, and an understanding of the methods for calculating the cPAH equivalents are required.

5 Impact of Changes in SRVs to Management of Dredge Material

To assist in predicting how changes in the SRVs may impact LMRWD management of dredge material, data from the Minnesota River sediments collected between 1978 and 2007 as reported in the Dredge Material Site Management Plan (LMRWD, 2013) was compared to 2022 MPCA Residential/Recreational SRVs and SLVs to assess whether it meets MPCA Unregulated Fill guidelines (MPCA, 2012) and Level 1 category for dredged material management (MPCA, 2014b). The results are shown on Table 3.

The only parameter above SLVs or the Residential/Recreational SRV was manganese. The manganese Residential SRV decreased from 3,600 mg/kg in 2009 to 730 mg/kg in 2022. Nearly all manganese results were also above the SLV of 130 mg/kg. The manganese concentrations in the Minnesota River sediments are consistent with naturally-occurring background levels in soil (USGS, 2013), and may be partially attributed to the geochemical composition of the sediments or a result of inputs to the river through runoff from soils. While The MPCA recognizes that some naturally-occurring levels of metals in soils are above SRVs or SLVs, the presence of chemical concentrations above these Unregulated Fill screening levels may limit the ability to sell the dredged materials in the private market for beneficial reuse.

A comparison of more recent USACE sediment data, if available, would be useful for assessing the potential for cost impacts to LMWRD for managing dredge material and evaluating if it is suitable for beneficial reuse.

The MPCA has indicated they intend to update the SRVs on an annual basis, so LMRWD should consider potential changes to SRVs in the long term management plan for dredged materials. If sediments are sampled and analyzed for chemical analysis, the data should be compared to the most recent SRVs in determining beneficial reuse. If the material is stored on the site for more than a year, re-evaluation of the sediment data using updated SRVs may be warranted prior to removing the material from the site for offsite reuse. It should be anticipated that projects receiving the dredged soil for reuse will be making comparisons to current SRVs.

Barr is not aware of MPCA revisiting past soil management and reuse decisions at off-site locations based on then-current SRVs/SLVs, but as MPCA continues to adjust their values, there is some risk that past reuse of sediments at off-site locations may come under new scrutiny in the future if testing is conducted as part of a construction or remediation project.

6 PFAS Monitoring Plan

On March 22, 2022, the MPCA published the final version of its PFAS Monitoring Plan (MPCA, 2022). The plan addresses issues identified in Minnesota's PFAS Blueprint (MPCA, 2021), released in February 2021, and responds to public comments submitted to the MPCA. Given the wide-spread use of PFAS over the past 70 years and their persistence, they are considered ubiquitous in the environment. Therefore, to

address PFAS broadly and consistently the MPCA is taking a statewide and coordinated approach across their permitting and cleanup programs as document in their PFAS Monitoring Plan.

In general, the MPCA's approach has been to initiate sampling across select industries and sites, and then develop future efforts based on the results. Looking ahead, MPCA's approach is expected to expand PFAS sampling over time and will result in an evolving regulatory approach as more information is developed.

The plan addresses monitoring requirements under five different MPCA programs:

- Air Program. Selected permitted facilities via emissions inventory reporting and stack testing;
- Wastewater Program. Subset of municipal wastewater treatment plants and industrial facilities via influent monitoring;
- Solid Waste/Hazardous Waste Program. Selected facilities via leachate or groundwater sampling;
- Industrial Stormwater Program. Selected airports, chrome plating facilities, and automotive shredding facilities via stormwater sampling; and
- Remediation Program: Phased program with additional specific guidance forthcoming.

The MPCA relied on a set of North American Industry Classification System (NAICS) codes to identify facilities that are likely to have used, emitted or discharged PFAS. The monitoring plan ultimately listed over 400 specific facilities in the "initial" phase of monitoring, including 169 manufacturing/industrial facilities, 8 regional airports, 145 landfills/solid waste management facilities, and 91 municipal wastewater treatment plants. The plan notes a differentiation between facilities that may be a source of PFAS (e.g. industrial facilities that used PFAS) and facilities that are likely "conduits" for PFAS into the environment (e.g., waste management, recycling, etc.)

The MPCA's stated intention is to have the monitoring plan "avoid duplication" for a specific facility (e.g., sampling under multiple MPCA programs or for multiple media). However, the plan clearly states that sampling of other media, under additional programs may be required after the initial phase (e.g., results of stack testing may lead to a request for industrial stormwater sampling). The identified facilities began receiving MPCA letters requesting sampling in mid-2022. While dredge material or sediment sampling for PFAS is not explicitly mentioned it the PFAS Monitoring Plan, such activities may potentially follow findings of PFAS impacts in stormwater or wastewater discharges to the Minnesota River.

The MPCA's PFAS Monitoring Plan leverages existing program and permit structures to require PFAS sampling at facilities. Although there does not appear to be an immediate requirement for LMRWD facilities to sample or address PFAS in the MPCA PFAS Monitoring Plan, this may be a future requirement if, for example, PFAS sources are found to be located near USACE or private dredge sites in the LMRWD. Although Barr has not completed an exhaustive review, the following facilities within the watershed are types of facilities that are likely to have used, discharged, emitted, and/or 'served as conduits' for PFAS: Blue Lake Wastewater Treatment Plant, Seneca Wastewater Treatment Plant, Flying Cloud Airport, Minneapolis/St. Paul International Airport, and numerous dumps and landfills (operating or historical).

Note as precedent, that the MPCA has investigated, and found, PFAS impacts in sediments in the Mississippi River (MPCA, 2013). Additionally, MPCA has listed 25 bodies of water in the state on its impaired waters list due to impacts from PFAS (MPCA, 2022e). While there is currently no statewide value for PFAS chemicals in surface water, MPCA has developed a site-specific water quality criteria (SSWQC) for perfluorooctane sulfonic acid (PFOS) protective of fish consumption in an area around Lake Elmo, Bde Maka Ska, and Pool 2 of the Mississippi River. Specifically, the SSWQC is 0.05 parts per trillion (ppt) PFOS, which is below current laboratory quantitative limits. (https://www.pca.state.mn.us/waste/water-quality-criteria-development-pfas). MPCA has acknowledged that such low values (derived from risk-based calculations and modeling) may be challenging to measure and attain in practice, but MPCA has also indicated that permit conditions for facilities that directly discharge to these impaired waterbodies are being evaluated for additional requirements where necessary.

Current SRVs for PFAS are shown on Tables 1 and 2, but future SRV updates are expected to result in lower SRVs for PFAS given evolving understanding of PFAS toxicity and other regulatory trends in other PFAS screening levels.

Another recent development for monitoring PFAS is the emerging concept of world-wide background concentrations of PFAS which is being monitored in rainfall and surface soils across widely distributed areas and land uses. As this concept advances, it may be another factor in distinguishing PFAS sources from specific industries verses baseline or background concentrations that are more ubiquitous. We are not aware that MPCA has developed a current position on this concept, but Barr believes it will emerge as a topic of interest as more PFAS data is collected across the state and beyond.

Given the airports, wastewater treatment plants and solid waste disposal and recycling facilities in the watershed, there is potential for PFAS to have been discharged to the Minnesota River through overland stormwater flow or direct discharges. The PFAS identified in the Mississippi River sediments is also indicative of potential PFAS presence upstream in the Minnesota River sediments. Given the general decreasing trends in PFAS regulatory criteria and screening levels, and the increase in monitoring across various Minnesota programs, it is likely that sampling of Minnesota River sediments for PFAS analysis may follow other monitoring programs. Due to the ubiquitous nature of PFAS and the persistence of these compounds in the environment, sampling of Minnesota River sediments may identify PFAS, and given the general decreasing trend in PFAS criteria, options for beneficial reuse of dredged materials may become more limited due to difficulty in meeting the increasingly lower PFAS SRVs. Presence of PFAS in dredged materials stored at the LMWRD Dredge Facility may also require controls to address runoff from stockpiles and leachate to the surrounding soil and groundwater and river.

Attachments:

Table 1 – Summary of MPCA Residential/Recreational Soil Reference Value Changes, 2009 – 2022, Sediment Parameter List and PFAS

Table 2 – Summary of MPCA Commercial/Industrial Soil Reference Value Changes, 2009 – 2022, Sediment Parameter List and PFAS

Table 3 – Minnesota River Sediment Chemical Data

7 References

American Society for Testing and Materials (ASTM), 2021. International Method E1527-21 (*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*).

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Table 1

Summary of MPCA Residential/Recreational Soil Reference Value Revisions, 2009 - 2022

Sediment Parameter List and PFAS

Chemical	Baseline Sediment Parameter List	Additional Sediment Parameter List	CAS No.	Most Recent SRV Revision Year	2021 Res/Rec Acute SRV* (mg/kg)	2022 Res/Rec Acute SRV (mg/kg)	Comparison Acute SRVs: 2022 to 2021 (% change)	2009 Residential SRV (mg/kg)	2021 Res/Rec Chronic SRV (mg/kg)	2022 Res/Rec Chronic SRV (mg/kg)	Comparison: Chronic SRVs 2022 to 2009 (% change)	Comparison: Chronic SRVs 2022 to 2021 (% change)
Inorganics												
Arsenic	X		7440-38-2	2016	9	9	0%	9	9	9	0%	0%
Barium		X	7440-39-3	2022	250	260	4%	1100	3000	3100	182%	3%
Cadmium	X		7440-43-9	2016	8.8	9.1	3%	25	1.6	1.6	-94%	0%
Chromium III	X		16065-83-1	2016				44000	23000	23000	-48%	0%
Chromium VI	X		18540-29-9	2022				87	11	2.3	-97%	-79%
Copper	X		7440-50-8	2016	110	120	9%	100	2200	2200	2100%	0%
Cyanide		X	57-12-5	2016	7.1	7.3	3%	60	13	13	-78%	0%
Lead	X		7439-92-1	2022				300	300	200	-33%	-33%
Manganese		X	7439-96-5	2022				3600	2100	730	-80%	-65%
Mercury (inorganic)	X		7439-97-6	2022				0.5	3.1	2.7	440%	-13%
Nickel	X		various	2016	250	260	4%	560	170	170	-70%	0%
Selenium	X		7782-49-2	2022				160	77	78	-51%	1%
Zinc (except zinc phosphide)	X		7440-66-6	2022				8700	4600	4700	-46%	2%
Per- and Polyfluoroalkyl Substances												
Perfluorobutanesulfonic acid (PFBS)			375-73-5	2022						1.1		
Perfluorobutanoic acid (PFBA)			375-22-4	2022				77		49	-36%	
Perfluorooctanesulfonic acid (PFOS)			1763-23-1	2019				2.1	0.041	0.041	-98%	0%
Perfluorooctanoic acid (PFOA)			335-67-1	2019				2.1	0.24	0.24	-89%	0%
Perfluorohexanesulfonic acid (PFHxS)			355-46-4	2019					0.13	0.13		0%
Perfluorohexanoic acid (PFHxA)			307-24-4	2022						1.9		
Polycyclic Aromatic Hydrocarbons												
Acenaphthene		X	83-32-9	2022				1200	450	460	-62%	2%
Anthracene		X	120-12-7	2021				7880	2800	2800	-64%	0%
Benzo[a]pyrene (BaP equivalents)		X	50-32-8	2019				2	2	2	0%	0%
Fluorene		X	86-73-7	2021				850	390	390	-54%	0%
Naphthalene		X	91-20-3	2016				81	81	710%	0%	
Pyrene		X	129-00-0	2021				890	220	220	-75%	0%
Quinoline		X	91-22-5	2016				4	1.4	1.4	-65%	0%
Polychlorinated Biphenyls												
PCBs (Polychlorinated Biphenyls)	X		1336-36-3	2022				1.2	0.81	0.82	-32%	1%
Pesticides												
Aldrin		X	309-00-2	2016				1	0.45	0.45	-55%	0%
Chlordane		X	12789-03-6	2022				13	9.5	9.6	-26%	1%
4,4-DDD (Dichlorodiphenyldichloroethane)		X	72-54-8	2016				56	19	19	-66%	0%
4,4-DDE		X	72-55-9	2022				40	22	23	-43%	5%
4,4-DDT		X	50-29-3	2022				15	7.3	7.4	-51%	1%
Dieldrin		X	60-57-1	2016				0.8	0.11	0.11	-86%	0%
Endrin		X	72-20-8	2016				8	4	4	-50%	0%
Heptachlor		X	76-44-8	2016				2	1.6	1.6	-20%	0%
gamma-Hexachlorocyclohexane (gamma-BHC, Lindane)		X	58-89-9	2022				9	4.3	0.15	-98%	-97%
Toxaphene		X	8001-35-2	2022				13	4.1	1.2	-91%	-71%
Dioxins and Furans												
TCDD (2,3,7,8-) (2,3,7,8 TCDD equivalents, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)		X	1746-01-6	2021				0.00002	0.000007	0.000007	-65%	0%

* Acute SRV = Acute SRVs are published for select parameters. No Acute SRVs were established in 2009.

X = Baseline and Additional Sediment Parameter Lists from Managing Dredge Materials in the State of Minnesota. wq-gen2-01. April, 2014. https://www.pca.state.mn.us/sites/default/files/wq-gen2-01.pdf

See the MPCA SRV spreadsheet for a complete list of SRVs and detailed footnotes. https://www.pca.state.mn.us/sites/default/files/c-r1-06.xlsx

Table 2
Summary of MPCA Commercial/Industrial Soil Reference Value Revisions, 2009 - 2022
Sediment Parameter List and PFAS

Chemical	CAS No.	SRV Revision Year	Baseline Sediment Parameter List	Additional Sediment Parameter List	2009 Industrial SRV (mg/kg)	2021 Com/Ind Chronic SRV (mg/kg)	2022 Com/Ind Chronic SRV (mg/kg)	Comparison of 2022 SRV to 2009 SRV (% change)	Comparison of 2022 SRV to 2021 SRV (% change)
Inorganics									
Arsenic	7440-38-2	2016	X		20	9	9	-55%	0%
Barium	7440-39-3	2021		X	18000	41000	41000	128%	0%
Cadmium	7440-43-9	2016	X		200	23	23	-89%	0%
Chromium III	16065-83-1	2016	X		100000	100000	100000	0%	0%
Chromium VI	18540-29-9	2021	X		650	62	62	-90%	0%
Copper	7440-50-8	2016	X		9000	33000	33000	267%	0%
Cyanide	57-12-5	2016		X	5000	190	190	-96%	0%
Lead	7439-92-1	2022	X		700	700	460	-34%	-34%
Manganese	7439-96-5	2022		X	8100	26000	10000	23%	-62%
Mercury (inorganic)	7439-97-6	2016	X		1.5	3.1	3.1	107%	0%
Nickel	various	2016	X		2500	2600	2600	4%	0%
Selenium	7782-49-2	2016	X		1300	1200	1200	-8%	0%
Zinc (except zinc phosphide)	7440-66-6	2016	X		75000	70000	70000	-7%	0%
Per- and Polyfluoroalkyl Substances									
Perfluorobutanesulfonic acid (PFBS)	375-73-5	2022				77	15		-81%
Perfluorobutanoic acid (PFBA)	375-22-4	2022			500	280	250	-50%	-11%
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	2022			14	0.56	0.54	-96%	-4%
Perfluorooctanoic acid (PFOA)	335-67-1	2022			13	3.2	3	-77%	-6%
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	2022				1.7	1.6		-6%
Perfluorohexanoic acid (PFHxA)	307-24-4	2022					24		
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	2021		X	5260	6800	6800	29%	0%
Anthracene	120-12-7	2021		X	45400	42000	42000	-7%	0%
Benzo[a]pyrene (BaP equivalents)	50-32-8	2019		X	3	23	23	667%	0%
Fluorene	86-73-7	2021		X	4120	5800	5800	41%	0%
Naphthalene	91-20-3	2021		X	28	280	280	900%	0%
Pyrene	129-00-0	2021		X	5800	3200	3200	-45%	0%
Quinoline	91-22-5	2016		X	7	7.8	7.8	11%	0%
PCBs (Polychlorinated Biphenyls)	1336-36-3	2016	X		8	10	10	25%	0%
Pesticides									
Aldrin	309-00-2	2021		X	2	2.6	2.6	30%	0%
Carbazole	86-74-8	2016		X	1310	1300	1300	-1%	0%
4,4-DDD (Dichlorodiphenyldichloroethane)	72-54-8	2016		X	125	100	100	-20%	0%
4,4-DDE	72-55-9	2021		X	80	130	130	63%	0%
4,4-DDT	50-29-3	2021		X	88	87	87	-1%	0%
Dieldrin	60-57-1	2016		X	2	1.5	1.5	-25%	0%
Endrin	72-20-8	2016		X	56	54	54	-4%	0%
Heptachlor	76-44-8	2021		X	3.5	8.9	8.9	154%	0%
gamma-Hexachlorocyclohexane (gamma-BHC, Lindane)	58-89-9	2022		X	15	25	2.1	-86%	-92%
Toxaphene	8001-35-2	2022		X		23	16		-30%
Dioxins and Furans									
TCDD (2,3,7,8-) (2,3,7,8 TCDD equivalents, 2,3,7,8-Tetrachlorodibenzo-p-dioxin)	1746-01-6	2021		X	0.000035	0.000028	0.000028	-20%	0%

X = Baseline and Additional Sediment Parameter Lists from Managing Dredge Materials in the State of Minnesota. wq-gen2-01. April, 2014. https://www.pca.state.mn.us/sites/default/files/wq-gen2-01.pdf
See the MPCA SRV spreadsheet for a complete list of SRVs and detailed footnotes. https://www.pca.state.mn.us/sites/default/files/c-r1-06.xlsx

Table 2
Minnesota River Sediment Chemical Data*
Lower Minnesota River Watershed District

				MN Soil Leaching Values (June 2013)	MN Acute Residential/ Recreational SRVs (April 2022)	MN Chronic Residential SRVs (April 2022)							
			Record #				78507	402	301	302	303	78506	401	404
			River Mile				14.7	14.6	14.52	14.51	14.5	14.5	14.4	13.4
			Location				Above Savage RR Bridge	Above Savage RR Bridge	Above Savage RR Bridge	Above Savage RR Bridge	Above Savage RR Bridge	Above Savage RR Bridge	Above Savage RR Bridge	AB & BLW CARGILL
			Year				1999	1989	1982	1982	1978	1999	1989	1989
Criteria Exceedance Key				**Bold**	No Exceedances	Shaded								
CHC's	ug/kg		a-BHC			700	< 0.08	< 0.01				< 0.08	< 0.08	< 0.07
	ug/kg		b-BHC			2500	< 0.08	< 0.2				< 0.08	< 0.16	< 0.15
	ug/kg		BHC				< 0.08	< 0.3				< 0.08	< 0.24	< 0.22
	ug/kg		2,4´-DDD											
	ug/kg		2,4´-DDE											
	ug/kg		2,4´-DDT											
	ug/kg		g-BHC (lindane)			150	< 0.08	< 0.13				< 0.08	< 0.11	< 0.1
	ug/kg		Heptachlor			1600	< 0.10	< 0.1				< 0.10	< 0.08	< 0.07
	ug/kg		Anthracene	1300000		2800000								
	ug/kg		Aldrin			450		< 0.13					< 0.11	< 0.1
	ug/kg		Acenaphthene	81000		460000								
	ug/kg		Acenaphthylene											
	ug/kg		Benz(a)anthracene											
	ug/kg		Benzo(a)pyrene	1400		2000								
	ug/kg		Heptachlorepoxide			280	< 0.12	< 0.17				< 0.12	< 0.13	< 0.12
	ug/kg		Benzo(g,h,i)perylene											
	ug/kg		Benzo(b)fluoranthene											
	ug/kg		Benzo(k)fluoranthene											
	ug/kg		Endosulfan I					< 0.17					< 0.13	< 0.12
	ug/kg		Dieldrin			110	< 0.04	< 0.17	< 0.1	< 0.1	< 1	< 0.04	< 0.13	< 0.12
	ug/kg		4,4'-DDE			23000	< 0.04	< 0.13	< 0.1	< 0.1		< 0.04	< 0.11	< 0.1
	ug/kg		Endrin			4000	< 0.06	< 0.3	< 0.1	< 0.1	< 1	< 0.06	< 0.24	< 0.22
	ug/kg		Endosulfan II					< 0.33					< 0.26	< 0.25
	ug/kg		4,4'-DDD			19000	< 0.06	< 0.36	< 0.1	< 0.1		< 0.06	< 0.29	< 0.27
	ug/kg		Endrinaldehyde					< 0.36					< 0.29	< 0.27
	ug/kg		Endosulfan sulfate					< 0.36					< 0.29	< 0.27
	ug/kg		4,4'-DDT			7400	< 0.18	< 0.43	< 0.1	< 0.1	< 4	< 0.18	< 0.34	< 0.32
	ug/kg		Methoxychlor					< 0.73					< 0.58	< 0.55
	ug/kg		Endrinketone					< 0.36					< 0.29	< 0.27
	ug/kg		alpha-Chlordane			9600								
	ug/kg		Chlorodane			9600	< 0.20	< 1.98	< 1	< 1		< 0.20	< 1.58	< 1.49
	ug/kg		gamma-Chlordane			9600								
	ug/kg		Oxychlordane				< 0.20					< 0.20		
	ug/kg		Fluoranthene	670000		210000								
	ug/kg		Toxaphene			1200		< 1.98					< 1.58	< 1.49
	ug/kg		Hexachlorobenzene			220								
	ug/kg		Pyrene	440000		220000								
METALS	mg/kg		Ag (silver)	7.9		78								
	mg/kg		Al (aluminum)			19000								
	mg/kg		As (arsenic)	5.8	9	9	1.30	< 1.2	1.6	2.2	2.54	1.81	< 1.2	1.6
	mg/kg		B (boron)	62		3100								
	mg/kg		Ba (barium)	1700	260	3100								
	mg/kg		Be (beryllium)	2.7		31								
	mg/kg		Cd (cadmium)	8.8	9.1	1.6	< 0.03	< 1.3	< 0.2	< 0.19	1.18	< 0.03	< 1.3	< 1.3
	mg/kg		Cr (chromium)	36		23000	3.25	3.8	3.9	4.2	28.7	3.82	4.3	5
	mg/kg		Cu (copper)	700	120	2200	1.72	8.7	2.9	3.3	12	2.04	13.3	4.8
	mg/kg		Fe (iron)			29000			4300	5500	10700			
	mg/kg		Hg (mercury)	3.3		2.7	0.0065	< 0.01	0.015	0.0165	0.031	0.0069	< 0.01	< 0.01
	mg/kg		Mg (magnesium)											
	mg/kg		Mn (manganese)	**130**		730	**143**	**254**			**419**	**931**	**263**	**232**
	mg/kg		Mo (molybdenum)	16		78								
	mg/kg		Ni (nickel)	180	260	170	6.14	7.5	7	7	16.7	8.27	< 6.4	7
	mg/kg		Pb (lead)	2700		200	5.0	4.4	4	4.4	44	6.3	4.6	3.6
	mg/kg		Sb (antimony)	5.4		6.3								
	mg/kg		Se (selenium)	2.6		78		< 0.92					< 0.93	< 0.93
	mg/kg		Sn (tin)	20000		4700								
	mg/kg		Sr (strontium)	2800		6700								
	mg/kg		Ti (titanium)			40000								
	mg/kg		Zn (zinc)	3000		4700	9.47					12.3		
	mg/kg		V (vanadium)	4		62								
	mg/kg		Chromium, Hexavalent	36		2.3								
PCB's	ug/kg		Aroclor-1016				< 0.24	< 1.98				< 0.24	< 1.58	< 1.49
	ug/kg		Aroclor-1221				< 0.28	< 1.98				< 0.28	< 1.58	< 1.49
	ug/kg		Aroclor-1232				< 0.26	< 1.98				< 0.26	< 1.58	< 1.49
	ug/kg		Aroclor-1242				< 0.32	< 1.98				< 0.32	< 1.58	< 1.49
	ug/kg		Aroclor-1248				< 0.22	< 1.98				< 0.22	< 1.58	< 1.49
	ug/kg		Aroclor-1254				< 0.34	< 4.13				< 0.34	< 3.3	< 3.1
	ug/kg		Aroclor-1260				< 0.32	< 4.13				< 0.32	< 3.3	< 3.1
	ug/kg		Total PCB's	130		820								
PARTICLE SIZE %FINER	SAND	coarse	3 in								100			
			1 1/2						100	100	100			
			3/4						100	100	100			
			3/8						100	100	100			
			4					100.0	100	100	100	100	99.9456	100
			8						100	100				
			10					99.8				98	99.7595	99.9211
		medium	16					99.5	100	100		94	99.3005	99.3583
			20											
			30				100	98.5	100	100		88	93.9681	92.8675
			40				98		100	99				
			50					98.5	98	96			93.9681	92.8675
		fine	60				80					48		
			70						87	79				
			80					84.8					83.0929	68.9342
			100				16	13.5	58	50		10	10.3533	14.5539
			140				7	8.5				50	6.36015858	9.9257696
	SILT	clay	200				2	4.8	31	36	34	2	4.39382985	7.18111026
			270				1	4.5	25	32		1	2.93210559	5.17041208
			0.20 mm					3.5	11	19			2.14905649	3.62252512
			0.05 mm					2.1	5	8	21		1	2.09050416
MISC	mg/kg		Total Organic Carbon											
	%		Total Organic Carb				0.04	0.4				0.03	0.91	1.13
	mg/kg		Chem Oxy Demand						10000	10580	19700			
	mg/kg		Kjedahl Nitrogen						440	520	740			
	mg/kg		Phosphorus (as P)						290	230	561			
	mg/kg		Oil and Grease											
	mg/kg		Cyanide, Total	20	7.3	13	< 0.20					< 0.20		
	mg/kg		Ammonia											
	mg/l		Ammonia Elutriate											
	%		Moisture				0.2					0.2		
	%		Total Solids				99.8					99.8		
	gVS/gTS		Total Volatile Solids											
	%		Volatile Solids				0.41					0.54		
	mg/kg		Phenolics, Total											

* Data table reproduced from Cargill East River (MN – 14.2 RMP) Dredge Material Site Management Plan, Lower Minnesota River Watershed District, Appendix A: Chemical Analyses Data for the Minnesota River.

Table 3
Minnesota River Sediment Chemical Data*
Lower Minnesota River Watershed District

				Record #	MN Soil Leaching Values (June 2013)	MN Acute Residential/ Recreational SRVs (April 2022)	MN Chronic Residential SRVs (April 2022)	304	305	403		78505	306	405	78504
				River Mile				13.21	13.2	13.2	12.9	12.5&12.6	12.5	12.4	12.3
				Location				AB & BLW CARGILL	AB & BLW CARGILL	AB & BLW CARGILL	Cargill	Cargill Slip	AB&BW PETERSON BAR	AB&BW PETERSON BAR	Peterson's Bar
				Year				1979	1979	1989	10/17/2007	1999	1980	1989	1999
Criteria Exceedance Key					**Bold**	No Exceedances	Shaded								
CHC's	ug/kg			a-BHC			700			< 0.11		< 0.08		< 0.07	< 0.08
	ug/kg			b-BHC			2500			< 0.21		< 0.08		< 0.14	< 0.08
	ug/kg			BHC						< 0.32		< 0.08		< 0.22	< 0.08
	ug/kg			2,4´-DDD							< 4				
	ug/kg			2,4´-DDE							< 4				
	ug/kg			2,4´-DDT							< 4				
	ug/kg			g-BHC (lindane)			150			< 0.14		< 0.08		< 0.1	< 0.08
	ug/kg			Heptachlor			1600			< 0.11		< 0.10		< 0.07	< 0.10
	ug/kg			Anthracene	1300000		2800000				< 0.79				
	ug/kg			Aldrin			450			< 0.14				< 0.1	
	ug/kg			Acenaphthene	81000		460000				< 0.71				
	ug/kg			Acenaphthylene							< 1.0				
	ug/kg			Benz(a)anthracene							1.8				
	ug/kg			Benzo(a)pyrene	1400		2000				1.7				
	ug/kg			Heptachlorepoxide			280			< 0.18		< 0.12		< 0.12	< 0.12
	ug/kg			Benzo(g,h,i)perylene							1.6				
	ug/kg			Benzo(b)fluoranthene							3.1				
	ug/kg			Benzo(k)fluoranthene							0.94				
	ug/kg			Endosulfan I						< 0.18				< 0.12	
	ug/kg			Dieldrin			110	0	0	< 0.18	< 3.2	< 0.04	0	< 0.12	< 0.04
	ug/kg			4,4'-DDE			23000	0	0	< 0.14	< 3.5	< 0.04	0	< 0.1	< 0.04
	ug/kg			Endrin			4000	0	0	< 0.32		< 0.06	0	< 0.22	< 0.06
	ug/kg			Endosulfan II						< 0.35				< 0.24	
	ug/kg			4,4'-DDD			19000	0	0	< 0.39	< 3.7	< 0.06	0	< 0.26	< 0.06
	ug/kg			Endrinaldehyde						< 0.39				< 0.26	
	ug/kg			Endosulfan sulfate						< 0.39				< 0.26	
	ug/kg			4,4'-DDT			7400	0	0	< 0.46	< 4.2	< 0.18	0	< 4.8	< 0.18
	ug/kg			Methoxychlor						< 0.77				< 0.53	
	ug/kg			Endrinketone						< 0.39				< 0.26	
	ug/kg			alpha-Chlordane			9600				< 1.7				
	ug/kg			Chlorodane			9600	0	0	< 2.11		< 0.20	0	< 1.44	< 0.20
	ug/kg			gamma-Chlordane			9600				< 1.6				
	ug/kg			Oxychlordane								< 0.20			< 0.20
	ug/kg			Fluoranthene	670000		210000				5				
	ug/kg			Toxaphene			1200			< 2.11				< 1.44	
	ug/kg			Hexachlorobenzene			220				< 2				
	ug/kg			Pyrene	440000		220000				4.3				
METALS	mg/kg			Ag (silver)	7.9		78								
	mg/kg			Al (aluminum)			19000								
	mg/kg			As (arsenic)	5.8	9	9	0	0	2.7	0.97	1.89	0	1.8	1.16
	mg/kg			B (boron)	62		3100								
	mg/kg			Ba (barium)	1700	260	3100	40	80				40		
	mg/kg			Be (beryllium)	2.7		31								
	mg/kg			Cd (cadmium)	8.8	9.1	1.6	< 10	< 10	< 1.6	< 1.0	< 0.03	< 10	< 1.2	< 0.03
	mg/kg			Cr (chromium)	36		23000	< 10	< 10	8.1	4.7	3.81	20	3.4	2.96
	mg/kg			Cu (copper)	700	120	2200	< 10	< 10	15	1.9	2.18	< 10	3.9	1.24
	mg/kg			Fe (iron)			29000	3800	9700				2600		
	mg/kg			Hg (mercury)	3.3		2.7	0	0	< 0.02	< 0.10	0.0052	0	< 0.01	< 0.0048
	mg/kg			Mg (magnesium)											
	mg/kg			Mn (manganese)	**130**		730	**160**	**720**	56.8	**218**	**242**	**170**	**163**	**154**
	mg/kg			Mo (molybdenum)	16		78								
	mg/kg			Ni (nickel)	180	260	170	< 10	20	9.4	< 0.10	7.92	< 10	< 6.2	6.12
	mg/kg			Pb (lead)	2700		200	< 10	20	5.8	2.5	6.3	< 10	3	4.7
	mg/kg			Sb (antimony)	5.4		6.3								
	mg/kg			Se (selenium)	2.6		78			< 1.2				< 0.89	
	mg/kg			Sn (tin)	20000		4700								
	mg/kg			Sr (strontium)	2800		6700								
	mg/kg			Ti (titanium)			40000								
	mg/kg			Zn (zinc)	3000		4700				12.1	11.1			8.12
	mg/kg			V (vanadium)	4		62								
	mg/kg			Chromium, Hexavalent	36		2.3				< 5.9				
PCB's	ug/kg			Aroclor-1016						< 2.11	< 50	< 0.24		< 1.44	< 0.24
	ug/kg			Aroclor-1221						< 2.11	< 50	< 0.28		< 1.44	< 0.28
	ug/kg			Aroclor-1232						< 2.11	< 50	< 0.26		< 1.44	< 0.26
	ug/kg			Aroclor-1242						< 2.11	< 50	< 0.32		< 1.44	< 0.32
	ug/kg			Aroclor-1248						< 2.11	< 40	< 0.22		< 1.44	< 0.22
	ug/kg			Aroclor-1254						< 4.4	< 50	< 0.34		< 3	< 0.34
	ug/kg			Aroclor-1260						< 4.4	< 40	< 0.32		< 3	< 0.32
	ug/kg			Total PCB's	130		820								
PARTICLE SIZE %FINER		SAND	coarse	3 in				100	100				100		
				1 1/2				100	100				100		
				3/4				100	100				100		
				3/8				100	100				100		
				4				100	100	99.4659	99.14	99	100	99.3761	
				8									100		
				10				100	100	99.339	64.29	97		98.6943	
			medium	16						98.8504		93	100	96.2073	100
				20				100	100		84.45				
				30						96.6491		95		83.8046	99
				40				100	100		66.31	71	99		95
				50						96.6491				83.8046	
			fine	60							33.37	37			39
				70											
				80				92	80	92.6698	6.97			41.9038	
				100						42.5172	5.26	6	42	17.4719	4
				140						26.39172056		3		10.74500323	2
		SILT	clay	200				12	46	17.37520712	2.87	1	20	6.81403086	1
				270						11.90172384				4.65926604	
				0.20 mm				5	35	8.54970672			7	3.29043663	
				0.05 mm				2	19	4.54007512			2	2.30048832	
MISC	mg/kg			Total Organic Carbon							< 85				
	%			Total Organic Carb						1.02		0.03		1.11	0.02
	mg/kg			Chem Oxy Demand				8700	29000				5300		
	mg/kg			Kjedahl Nitrogen				1300	4100		170		1600		
	mg/kg			Phosphorus (as P)				400	510		280				
	mg/kg			Oil and Grease											
	mg/kg			Cyanide, Total	20	7.3	13				< 0.20	< 0.20			< 0.20
	mg/kg			Ammonia							6.5				
	mg/l			Ammonia Elutriate											
	%			Moisture							25.57	0.2			0.2
	%			Total Solids							74.43	99.8			99.8
	gVS/gTS			Total Volatile Solids							0.013				
	%			Volatile Solids								0.35			0.25
	mg/kg			Phenolics, Total							1.5				

* Data table reproduced from Cargill East River (MN – 14.2 RMP) Dredge Material Site Management Plan, Lower Minnesota River Watershed District, Appendix A: Chemical Analyses Data for the Minnesota River.

Table 3
Minnesota River Sediment Chemical Data*
Lower Minnesota River Watershed District

				Record #				307	78503	406	78502	308		78501
				River Mile				12	12.0	11.7	11.5	11.4	11.3	11.0
				Location				AB&BW PETERSON BAR	Peterson's Bar	AB&BW PETERSON BAR	Blw Peterson's Bar	AB&BW PETERSON BAR	Above 35W	Blw Perterson's Bar
				Year				1975	1999	1989	1999	1980	10/17/2007	1999
					MN Soil Leaching Values (June 2013)	MN Acute Residential/ Recreational SRVs (April 2022)	MN Chronic Residential SRVs (April 2022)							
Criteria Exceedance Key					**Bold**	No Exceedances	Shaded							
CHC's	ug/kg			a-BHC			700		< 0.08	< 0.09	< 0.08			< 0.08
	ug/kg			b-BHC			2500		< 0.08	< 0.18	< 0.08			< 0.08
	ug/kg			BHC					< 0.08	< 0.27	< 0.08			< 0.08
	ug/kg			2,4´-DDD									< 4	
	ug/kg			2,4´-DDE									< 4	
	ug/kg			2,4´-DDT									< 4	
	ug/kg			g-BHC (lindane)			150		< 0.08	< 0.12	< 0.08			< 0.08
	ug/kg			Heptachlor			1600		< 0.10	< 0.09	< 0.10			< 0.10
	ug/kg			Anthracene	1300000		2800000						1.4	
	ug/kg			Aldrin			450			< 0.12				
	ug/kg			Acenaphthene	81000		460000						< 0.71	
	ug/kg			Acenaphthylene									< 1.0	
	ug/kg			Benz(a)anthracene									8.4	
	ug/kg			Benzo(a)pyrene	1400		2000						9.8	
	ug/kg			Heptachlorepoxide			280		< 0.12	< 0.15	< 0.12			< 0.12
	ug/kg			Benzo(g,h,i)perylene									6.2	
	ug/kg			Benzo(b)fluoranthene									19	
	ug/kg			Benzo(k)fluoranthene									5.6	
	ug/kg			Endosulfan I						< 0.15				
	ug/kg			Dieldrin			110		< 0.04	< 0.15	< 0.04	0.5	< 3.2	< 0.04
	ug/kg			4,4'-DDE			23000		< 0.04	< 0.12	< 0.04	0	< 3.5	< 0.04
	ug/kg			Endrin			4000		< 0.06	< 0.27	< 0.06	0		< 0.06
	ug/kg			Endosulfan II						< 0.3				
	ug/kg			4,4'-DDD			19000		< 0.06	< 0.33	< 0.06	0.8	< 3.7	< 0.06
	ug/kg			Endrinaldehyde						< 0.33				
	ug/kg			Endosulfan sulfate						< 0.33				
	ug/kg			4,4'-DDT			7400		< 0.18	< 0.4	< 0.18	0	< 4.2	< 0.18
	ug/kg			Methoxychlor						< 0.67				
	ug/kg			Endrinketone						< 0.33				
	ug/kg			alpha-Chlordane			9600						< 1.7	
	ug/kg			Chlorodane			9600		< 0.20	< 1.82	< 0.20	1		< 0.20
	ug/kg			gamma-Chlordane			9600						< 1.6	
	ug/kg			Oxychlordane					< 0.20		< 0.20			< 0.20
	ug/kg			Fluoranthene	670000		210000						26	
	ug/kg			Toxaphene			1200			< 1.82				
	ug/kg			Hexachlorobenzene			220						< 2	
	ug/kg			Pyrene	440000		220000						21	
METALS	mg/kg			Ag (silver)	7.9		78							
	mg/kg			Al (aluminum)			19000							
	mg/kg			As (arsenic)	5.8	9	9	0.83	1.43	3.2	1.13	0	1.2	3.44
	mg/kg			B (boron)	62		3100							
	mg/kg			Ba (barium)	1700	260	3100					60		
	mg/kg			Be (beryllium)	2.7		31							
	mg/kg			Cd (cadmium)	8.8	9.1	1.6	< 0.1	< 0.03	< 1.6	< 0.03	< 10	< 1.0	0.17
	mg/kg			Cr (chromium)	36		23000	7	3.30	7.1	3.07	10	5.3	5.60
	mg/kg			Cu (copper)	700	120	2200	2.8	1.67	12.1	2.17	< 10	2.5	3.97
	mg/kg			Fe (iron)			29000					5200		
	mg/kg			Hg (mercury)	3.3		2.7	0.13	< 0.0048	< 0.02	< 0.0048	0	< 0.10	0.0058
	mg/kg			Mg (magnesium)										
	mg/kg			Mn (manganese)	**130**		730		**235**	59.3	**160**	**660**	**203**	**357**
	mg/kg			Mo (molybdenum)	16		78							
	mg/kg			Ni (nickel)	180	260	170		7.32	11.5	6.54	10	4.7	12.3
	mg/kg			Pb (lead)	2700		200	< 0.1	5.8	11.6	6.4	10	2.5	9.2
	mg/kg			Sb (antimony)	5.4		6.3							
	mg/kg			Se (selenium)	2.6		78			2.2				
	mg/kg			Sn (tin)	20000		4700							
	mg/kg			Sr (strontium)	2800		6700							
	mg/kg			Ti (titanium)			40000							
	mg/kg			Zn (zinc)	3000		4700		9.29		8.53		13.6	19.3
	mg/kg			V (vanadium)	4		62							
	mg/kg			Chromium, Hexavalent	36		2.3						< 5.8	
PCB's	ug/kg			Aroclor-1016					< 0.24	< 1.82	< 0.24		< 50	< 0.24
	ug/kg			Aroclor-1221					< 0.28	< 1.82	< 0.28		< 50	< 0.28
	ug/kg			Aroclor-1232					< 0.26	< 1.82	< 0.26		< 50	< 0.26
	ug/kg			Aroclor-1242					< 0.32	< 1.82	< 0.32		< 50	< 0.32
	ug/kg			Aroclor-1248					< 0.22	< 1.82	< 0.22		< 40	< 0.22
	ug/kg			Aroclor-1254					< 0.34	< 3.8	< 0.34		< 50	< 0.34
	ug/kg			Aroclor-1260					< 0.32	< 3.8	< 0.32		< 40	< 0.32
	ug/kg			Total PCB's	130		820							
PARTICLE SIZE %FINER		SAND	coarse	3 in				100				100		
				1 1/2				100				100		
				3/4				100				100		
				3/8				100				100		
				4				99	100	100		100	100	
				8				95				100		
				10					97	99.9173	100		99.89	100
			medium	16				84	92	99.6276	99	100		97
				20									99.04	
				30					84	98.5519	98			84
				40				41	76		94	98	95.1	
				50						98.5519				
			fine	60					37		38		64.79	54
				70										
				80						81.6715			27.25	
				100				6	4	52.1307		83	21.89	31
				140					1	40.47394665	2			21
		SILT	clay	200				2		26.9826311	1	70	13.16	13
				270						17.59732573				7
				0.20 mm						13.27129692		33		
				0.05 mm						9.16528674		18		
MISC	mg/kg			Total Organic Carbon									< 84	
	%			Total Organic Carb					0.01	1.2	0.02			0.18
	mg/kg			Chem Oxy Demand				1950				31000		
	mg/kg			Kjedahl Nitrogen								3700	300	
	mg/kg			Phosphorus (as P)									270	
	mg/kg			Oil and Grease										
	mg/kg			Cyanide, Total	20	7.3	13		< 0.20		< 0.20		< 0.20	< 0.20
	mg/kg			Ammonia									16	
	mg/l			Ammonia Elutriate										
	%			Moisture					0.2		0.1		24.88	0.7
	%			Total Solids					99.8		99.9		75.12	99.3
	gVS/gTS			Total Volatile Solids									0.013	
	%			Volatile Solids					0.49		0.29			0.95
	mg/kg			Phenolics, Total									6.2	

* Data table reproduced from Cargill East River (MN – 14.2 RMP) Dredge Material Site Management Plan, Lower Minnesota River Watershed District, Appendix A: Chemical Analyses Data for the Minnesota River.

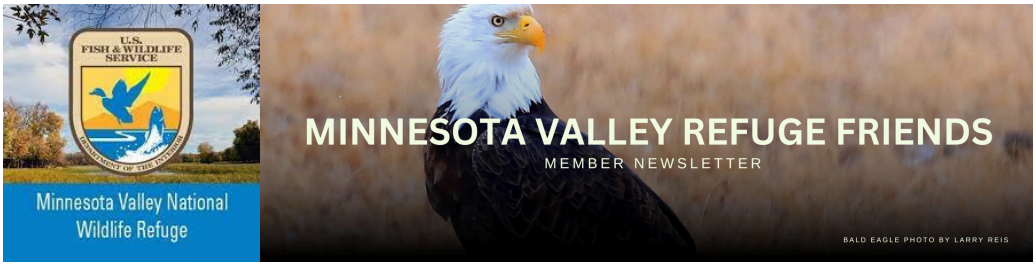
Gmail

Linda Loomis <naiadconsulting@gmail.com>

April Currents - News from MN Valley National Wildlife Refuge Friends

1 message

MN Valley Refuge Friends <hello@mnvalleyrefugefriends.org> Mon, Apr 8, 2024 at 11:54 PM
Reply-To: hello@mnvalleyrefugefriends.org
To: Linda Loomis <naiadconsulting@gmail.com>



Are you looking for a gift for a friend? Maybe a housewarming gift or to welcome a new neighbor to the area? The Blufftop Nature Store at the Bloomington Education and Visitor Center has just what you need - from books and cards by local artists to nature guides, coffee mugs, shirts, puzzles and so much more! Plus, our selection of bird stuffed animals - that even sing - are a real treasure here at the shop. Be sure to swoop in soon!

Did you know? You can also purchase MVRF memberships at the Nature store? They make great gifts for friends, teachers, neighbors ... and yourself!

Yellow-Headed Blackbird calling
Photo and Article: Michael Kurtz, MVRF Board Member

Calls of Spring

The changing of the season and return of warm weather this Spring coincides with the many sounds of nature. A robin calling in your yard, a chickadee chirping “Spring Time” in the woods or a blackbird near any wetlands are just a few tunes you may recognize. The red-wing blackbirds call early, they come to every wetland, pond and stream the Minnesota River Valley has to offer. The unique call of the yellow-headed blackbird which is louder and more of a screech can also be heard in most parts of the refuge (See Below for Sound). Other blackbirds you may see coming this month in the refuge include the Rusty and Brewer’s blackbird so get out and explore the Minnesota Valley National Wildlife Refuge!

Click to Hear the Red-Wing Blackbird.
Click to Hear the Yellow-Headed Blackbird

Volunteers are needed to help with activities for field trips at Old Cedar Avenue Bridge. This is a great opportunity to volunteer outside and work with kids.

May 8 and 9 - Volunteers needed 8:30am-2:00pm
May 10 - Volunteers needed come at 9:00am-2:00pm.

You will be outdoors helping to run watershed-related activities. There will be 4 stations volunteers will help run. Training will be provided.

Report to the pavilion in front of the restrooms at Old Cedar Avenue Bridge. Bring a lunch, bug spray, sunscreen and sturdy shoes.

If interested, please email us @ hello@mnvalleyrefugefriends.org.

You're Invited: This Month's Events the Refuge

Meet Minnesota Valley

Stop by the tent at Old Cedar Avenue to chat with refuge staff, ask that burning question, borrow equipment or enjoy a complimentary treat. Refuge staff will have engaging items to investigate, along with information and maps, binoculars and backpacks available for checkout during this time frame and complimentary snacks.

Date and Time: Tuesday, April 9th 6:00-7:30 PM

Location: Old Cedar Avenue - 9551 Old Cedar Ave S, Bloomington, MN 55420

Registration Information: No registration required.

Photo: Oscar Hernandez Ledesma/USFWS

Beginner Hiking Series: Bass Ponds

With Minnesota Valley National Wildlife Refuge covering over 14,000 acres, there are more than 45 miles of trails to discover! Join us on our beginner hiker series as we explore the trails together. No prior experience needed and no special equipment required.

Date and Time: Thursday, April 11th from 5:30 - 6:30 PM

Location: Bass Ponds - 2501 86th St. E, Bloomington, MN 55425

Registration Information: 10 walk in spots available and 15 spots open for voluntary registration through SignUp.com.

Photo: Thia Xiong/USFWS

Nature In Your Neighborhood

You don't have to leave your neighborhood to explore nature! Join a refuge ranger at your local library to learn all about animal eggs. We will explore who is laying eggs this Spring, go on an egg hunt and design our own egg! Activities are geared toward elementary-aged students, but all are welcome! Children must be accompanied by an adult.

Date and Time: Saturday, April 13th from 2pm-3pm
Location: Augsburg Park Library - 7100 Nicollet Ave, Richfield, MN 55423**Registration Information**: No registration required.
Activity Level: Easy-active, we will walk outside to the library lawn and explore in a small area.
Meet Us: Inside the library.

Date and Time: Friday, April 26th from 3pm-4pm
Location: Penn Lake Library - 8800 Penn Ave. S, Bloomington, MN 55431
Registration Information: No registration required.
Activity Level: Easy-active, we will walk outside to the library lawn and explore in a small

area.
Meet Us: Inside the library.

Photo: Tom Koerner/USFWS

Seeing in an Unseen World

In this workshop we will explore some of the techniques our ancient ancestors used to understand who was on the landscape and what they were doing. We often do not see many animals when we look out on the landscape, but they are there, and this workshop is designed to help us peer into that world. We'll split our time learning wildlife track and sign as well as animal language to give us a better understanding on what is going on in this unseen world.

Date and Time: Sunday, April 14th from 10AM - 1PM

Location: Bloomington Education and Visitor Center - 3815 American Blvd E, Bloomington, MN 55425

Registration Information: Capped at 15 participants. Registration Required: Sign Up.com

Activity Level: Easy-active. Some walking

Photo: USFWS

Earth Day Cleanups

It's not our trash, but it is our planet! Come by and grab some gloves, trash bags and head out on the trails to pick up any trash left behind over the long winter. Every little bit helps keeps the trails clean for people and wildlife alike to enjoy for a long time to come!

Date and Time: Saturday, April 20th from 12:00-2:00 PM
Location: Bass Ponds - 2501 86th St. E, Bloomington, 55425 MN
Registration Information: Registration Link: Signup.com Voluntary registration helps determine the amount of supplies to bring.
Meet Us: Meet us at the trailhead at the lower parking lot.

Date and Time: Sunday April 21st from 12:00-2:00 PM
Location: Old Cedar Avenue - 9551 Old Cedar Ave S, Bloomington, MN 55420
Registration Information: Registration Link: Signup.com Voluntary registration helps determine the amount of supplies to bring.
Meet Us: Meet us at the Old Cedar Avenue pavilion.

Photo: USFWS

Birdwatching Trek: Bass Ponds

Join us for a spring walk on one of the many refuge units. Each spring offers a chance to observe a variety of birds that stop at the refuge during their spring migration. The early spring walks will feature waterfowl, and the later spring walks will see the first of the migrant sparrows and warblers of the season.

Date & Time: Sunday, April 21st from 8:00-10:30 a.m.

Location: Bass Ponds - 2501 86th St. E, Bloomington, 55425 MN

Registration Information: Registration required on SignUp.com. Please indicate in your registration if you would like to receive a birding summary and species list from the walk. This program is capped at 25 participants.

Activity Level: Easy-active, but with a short but steep downhill walk from the parking lot. We will walk slowly and make frequent stops.

Meet Us: Meet at the upper Bass Ponds trailhead near the parking lot. Please consider carpooling with others in your party due to limited parking.

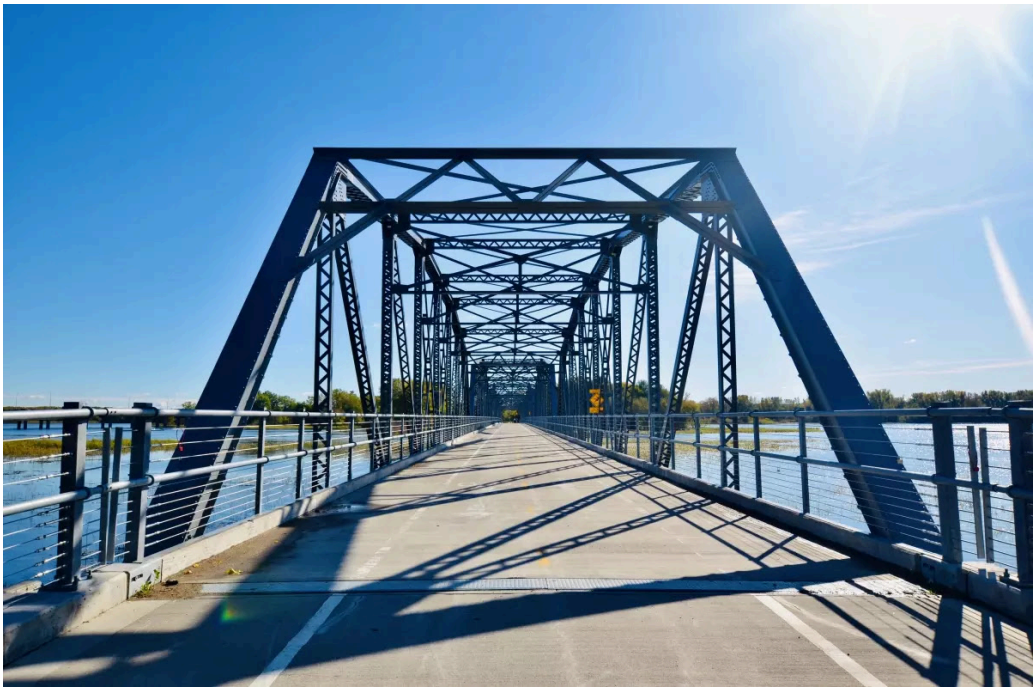


Photo: Thia Xiong/USFWS

Meet Minnesota Valley

Stop by the tent at Old Cedar Avenue to chat with refuge staff, ask that burning question, borrow equipment or enjoy a complimentary treat. Refuge staff will have engaging items to investigate, along with information and maps, binoculars and backpacks available for checkout during this time frame and complimentary snacks.

Date and Time:
Tuesday, April 23rd from 6:00 - 7:30 PM
Tuesday, May 7th from 6:00 -7:30 PM

Location: Old Cedar Avenue - 9551 Old Cedar Ave S, Bloomington, MN 55420

Registration Information: No registration required.

Activity Level: Easy - Stationary at tent, self-guided active exploration available.

Meet Us: Meet us at the tent at the Old Cedar Avenue Bridge trailhead.

Storywalks

Take a walk along the paved blufftop prairie trail and read from giant picture book pages displayed along the trail. The perfect activity for nature and book lovers with a new story every month!

Dates and Times:
April 25th from 10 AM - 4 PM
April 26th from 10 AM - 4 PM
April 27th from 10 AM - 4 PM
April 28th from 10 AM - 4 PM

Location: Bloomington Education and Visitor Center - 3815 American Blvd E, Bloomington, MN 55425

Registration Information: No registration required.

Activity Level: Easy-active, self-led.

Meet Us: The storywalk begins right outside the Bloomington Education and Visitor Center.

Photo: Marybelle Quinata/USFWS, Guam NWR

Sustainable Spring Crafts: Flowers and Picture Frames

Join us for the second session of our spring sustainable crafting series! This series is a monthly drop-in program for all to enjoy crafting using sustainable materials or get inspired with new ideas. We will have two family-friendly craft-making stations where you can choose from creating sunflowers from recycled cardboard and yarn or a picture frame from recycled cardboard and twigs which can include a photo taken at the refuge. Come stop by and capture some new memories!

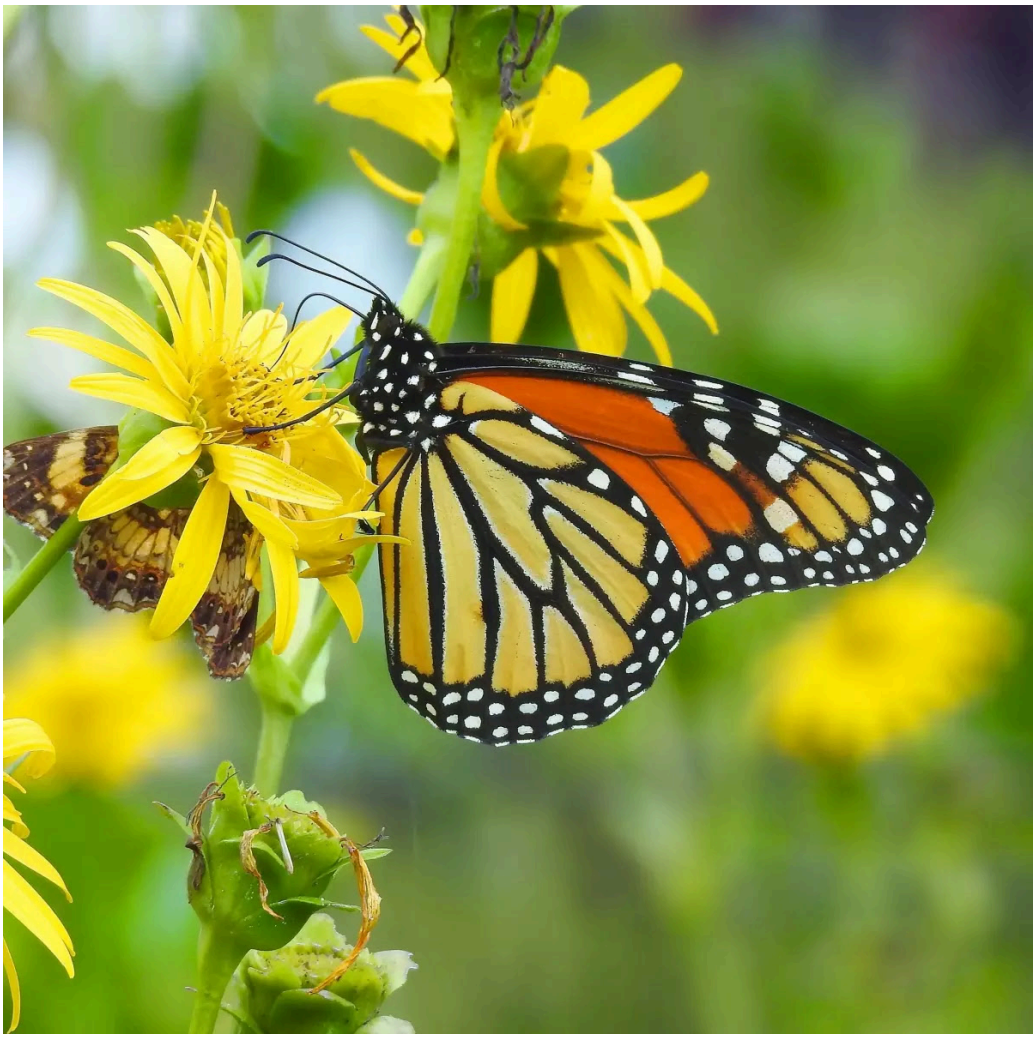
Date and Time: Sunday, April 28th from 1:00-3:00 PM

Location: Bloomington Education and Visitor Center - 3815 American Blvd E, Bloomington, MN 55425

Registration Information: No registration required.

Activity Level: Easy, we will be sitting at tables in the classrooms.

Meet Us: Meet in the classrooms at the Bloomington Education and Visitor Center.



Nature Novice: Mother's Day Floral Workshop

April showers bring May flowers! Join us in learning how plants support pollinators. Create a beautiful take-home floral arrangement or flower press using pollinator-friendly plants! Celebrate your amazing mom with a morning full of flowers.

Date and Time: Saturday, May 4th from 1:00-2:00 PM

Location: Bloomington Education and Visitor Center - 3815 American Blvd E, Bloomington, MN 55425

Registration Information: 10 walk in spots available and 15 spots open for voluntary registration through SignUp at: Signup.com

Activity Level: Easy-activity, we will be seated in the classrooms.

Meet Us: Meet in the classrooms at the Bloomington Education and Visitor Center.

Photo: USFWS/USFWS

Birdwatching Trek: Rapids Lake Visitor Center

Join us for a spring walk on one of the many refuge units. Each spring offers a chance to observe a variety of birds that stop at the refuge during their spring migration. The early spring walks will feature waterfowl, and the later spring walks will see the first of the migrant sparrows and warblers of the season.

Date & Time: Sunday, May 5th from 8:00-10:30 a.m.

Location: Rapids Lake Visitor Center - 15865 Rapids Lake Rd, Carver, MN 55315

Registration Information: Registration required on SignUp.com. Please indicate in your registration if you would like to receive a birding summary and species list from the walk. This program is capped at 25 participants.

Activity Level: Easy-active, but with a short but steep downhill walk from the parking lot. We will walk slowly and make frequent stops.

Meet Us: Meet outside the Rapids Lake visitor center near the parking lot. Please consider carpooling with others in your party due to limited parking.

Front entrance of the Bloomington Education and Visitor Center by Thia Xiong/USFWS

Visitor Centers @ The Refuge

The **Bloomington Education and Visitor Center** is open Thursdays through Sundays, 10 a.m. - 4 p.m. Visitors can talk with volunteers and staff, purchase America the Beautiful recreation passes and borrow FREE seasonal equipment to explore the refuge. Equipment available to check out includes binoculars, bird books and family activity backpacks. Bloomington Education and Visitor Center, 3815 American Blvd. East, Bloomington, MN 55425

The **Rapids Lake Education and Visitor Center** is temporarily closed to walk-in visitors. Trails are always open from 5:00 a.m. - 10:00 p.m., and the outdoor flush restrooms are still available for use. Located at 15865 Rapids Lake Rd, Carver, MN 55315.

Land and trail hours are open from 5 a.m. - 10 p.m.

Long Meadow Lake Trail is closed until further notice for trail construction and repair.

Our Contact Information
Minnesota Valley Refuge Friends
3815 American Blvd. E.
Bloomington, MN 55425
6512062696
http://www.mnvalleyrefugefriends.org

Engaging People with Nature.
Minnesota Valley Refuge Friends is a 501(c)(3) non-profit organization dedicated to the Minnesota Valley National Wildlife Refuge. Contributions are tax-deductible.
Thank you for your support!

Gmail

Linda Loomis <naiadconsulting@gmail.com>

Conservation Connection: April 2024

1 message

Hennepin County <hennepin@public.govdelivery.com> Tue, Apr 9, 2024 at 3:37 PM
Reply-To: hennepin@public.govdelivery.com
To: naiadconsulting@gmail.com

View in browser

In this issue:

- Funding and support for rural conservation projects
- Upcoming workshop and events
- Project spotlight: Using cover crops and "nurse crops"
- Update on DIY native plant milk jug experiment
- Creature feature: Pollinators

Funding and support for rural conservation projects

Apply for Continuous CRP by July 31, 2024

USDA is now accepting applications for the Continuous Conservation Reserve Program (Continuous CRP). USDA's Farm Service Agency (FSA) encourages agricultural producers and landowners in Minnesota who are interested in conservation opportunities for their land in exchange for yearly rental payments by considering the enrollment options available through Continuous CRP, which also includes the Conservation Reserve Enhancement Program (CREP) offered by FSA partners.

To submit an offer, producers should contact their local USDA Service Center by July 31, 2024, in order to have an offer effective by October 1, 2024. To ensure enrollment acreages do not exceed the statutory cap, FSA will accept offers from producers on a first-come, first-served basis. A producer can both enroll new acres into Continuous CRP and re-enroll any acres expiring September 30, 2024.

FSA water quality practices, such as riparian buffers, prairie strips, grassed waterways, and wetlands, will receive an additional 20% incentive. Buffer practices have a positive impact on water quality. Additionally, the Climate-Smart Practice Incentive launched in 2021 is also available in the Continuous signup.

For more information, please contact the Wright/Hennepin County FSA office at (763) 682-1982, Extension 2 or via email at mnbuffalo-fsa@usda.gov.

Minnesota DNR cost share program

Are you looking to improve woodlands on your property? The Minnesota Department of Natural Resources (DNR) cost share for woodlands program may be a good fit for you. The typical project size is any forested area between 3 and 20 acres. Landscaping projects are ineligible, but eligible activities include:

- Reforestation and tree planting
- Forest improvement (e.g., thinning out trees or pruning)
- Forest health and protection (e.g., removing invasive species, protecting trees from deer browse)
- Wildlife habitat enhancement
- Soil and water protection
- Riparian or fisheries habitat and improvement

- Forest recreation

To learn more, visit the DNR's website or reach out to the DNR forester for the north metro. Madisson Masucci, Madisson.Masucci@state.mn.us, 651-539-3316.

Spring tree sales

There are lots of options if you need to buy tree seedlings, shrubs, or native plant mixes. Below are links to nearby tree sales. Each organization has different species availability, so check and see if the tree you're looking for is being sold. Tree sales are first-come, first-served. Please order soon!

- Hennepin County tree sale
- Carver County SWCD tree sale
- Wright County SWCD tree sale
- Anoka County SWCD tree sale
- DNR tree sale
  *Note: the DNR tree sale has a minimum order of 500 seedlings

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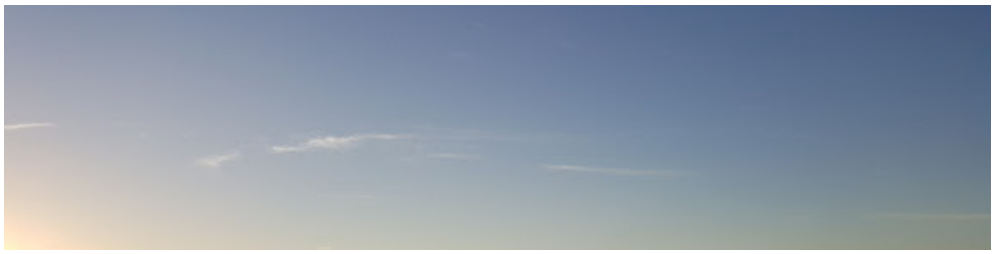
Lawns to Legumes

Want to BEE part of the change and add pollinator habitat to your yard? Consider applying for Lawns to Legumes. Minnesota residents can be reimbursed for up to $400 in costs associated with establishing native plantings and pollinator habitat. Applications for Fall 2024 projects are open until May 15.

Learn more and apply

Upcoming workshops and events



Cover it up! Protect your topsoil and bottom line with cover crops

Soil health and funding open house

Thursday, April 11
4:30-6:30 p.m.
Independence Community Room, City Hall
1920 County Road 90
Independence, MN

Join our staff this Thursday, April 11 at 4:30 p.m. for our Spring 2024 open house. This year, our featured topic is cover crops, soil health, and your bottom line. Guest Keith Olander from AgCentric and Central Lakes College will speak on the economics of cover crops and how you can make them work for your farm and your budget.

After the presentation wraps up (around 5:45 p.m.), you can visit with county staff or other partners, including the Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and habitat specialist staff, to ask any questions you may have about your land or funding opportunities.

Freebies you can get at the open house:

- Free pizza
- Sign up for free soil testing
- Raffle for bird and bat houses

RSVP so we can order the right amount of pizza.

Questions? Contact Roz Davis, conservation specialist, at rozalyn.davis@hennepin.us or 952-262-0397.

Earth Day and Arbor Day events

Earth Day and Arbor Day are both coming up this April, and there are many events planned locally to celebrate our community and environment.

Contribute to the Mighty Mississippi Cleanup Challenge

This year, we've accepted the challenge to participate in the Mighty Mississippi Cleanup to help keep our lakes, rivers, and streams clean and healthy. There are three ways to contribute to this effort between April 15 and May 15:

- Join a cleanup event – see our map of Earth Day events to find cleanups in your community.
- Organize your own cleanup with colleagues, neighbors, or friends. Use the Adopt-a-River toolkit from Freshwater to help plan. Report your data and share a photo to be included in our overall results.
- If you live in an area with storm sewers, sign up to Adopt-a-Drain and report your drain clean out – any data reported during the challenge in Hennepin County will be counted toward our results.

Twin Cities Metro Growers Network Spring Social

Tuesday, April 30
5:30-7:30 p.m.
Broken Clock Brewing Cooperative, B-Side Lounge
1712 Marshall St. NE Suite 100
Minneapolis, MN

Register for the event here

Calling all growers in the Twin Cities metro! Celebrate spring and connect with fellow farmers, gardeners and aspiring growers with the Twin Cities Metro Growers Network, which is a collaborative effort of Sustainable Farming Association and University of Minnesota Extension.

Discussion will include planning for the growing season, sharing successes from last year, and help addressing challenges and questions. Light appetizers provided, with food and drinks available for purchase at the brewery. This event is free to attend. Advance registration is appreciated for planning purposes, but walkups are welcome.

Meet Hennepin County's Tiara Burton (left with snapping turtle) and Nicole Witzel (right with puff mushroom)

Hennepin County staff at Art-a-Whirl

Friday, May 17, 5 to 10 p.m., Saturday, May 18, noon to 8 p.m., and Sunday, May 19, noon to 5 p.m.
Northrup King Building, Studio 332
1500 Jackson Street Northeast
Minneapolis, MN

Hennepin County ecologists, Nicole Witzel and Tiara Burton, along with other staff from the county's land and water unit will attend this year's Art-a-Whirl weekend in Studio 332 in the Northrup King Building.

County staff will table alongside seven artists creating art about pollinator gardens, healthy soil, compost, pollinators, and no mow lawns. Staff will share information about birds and bats, creating habitat in your yard, and animals native to Minnesota. Come visit!

Get to know Nicole

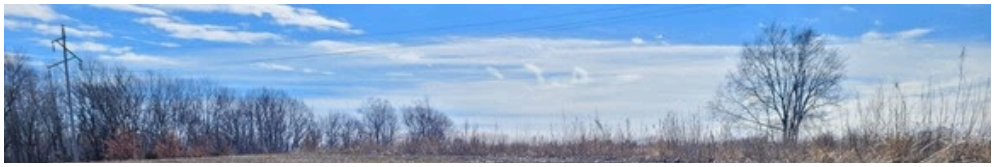
Nicole joined Hennepin County in 2021 as a wildlife biologist. She works on the county's biological monitoring program, surveying the plants and animals on Hennepin County properties and conservation easements. Her favorite part about the job is connecting with the people of the county through wildlife, which is something that everyone is passionate about. Contact her at nicole.witzel@hennepin.us.

Get to know Tiara

Tiara joined Hennepin County in 2023 as an environmentalist trainee. She supports habitat improvement activities and monitors wildlife on protected easements and natural areas. Her favorite part about the job is that every day is a different and exciting challenge and she gets to spend so much time outdoors working to protect Minnesota's incredible natural resources. Contact her at tiara.burton@hennepin.us.

Project spotlight

Sara's got it covered!



A cereal rye cover crop that was planted into soybean residue. The farmer did not till the soybean residue before planting the rye. At the time of the picture (taken March 6, 2024), the rye was about three inches tall.

Last spring, Sara, a new farmer in Dayton, reached out to us for assistance. She recently purchased a 17-acre plot of conventional corn and soybeans that she's starting to convert to a native-based perennial operation for horses and other livestock. Sara built her horse barn last summer and is in the process of finalizing the overall farm plan. In the meantime, she is using cover crops as "nurse crops" to prep the soil for her hay and pasture plantings. Planting transitional nurse crops is a common strategy to increase the likelihood that your desired seed mix (in this case a native perennial pasture/hay mix) will establish.

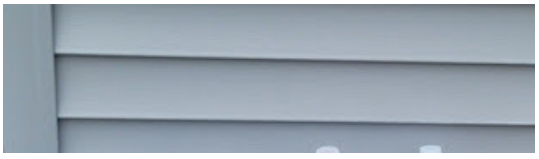
The first phase, pictured here, is cereal rye that was planted in November 2023 into soybean residue. Sara rented a no-till drill and didn't till the residue in at all to reduce disturbance to the soil. Phase two will get started in June, when she plans to introduce a more diverse nurse crop seed mix to give the soil an extra boost before she plants native perennial pasture/hay in the fall. Up to nine different species of grasses, brassicas (including daikon radish), and legumes will help reduce erosion and compaction, build soil biology and organic matter, and create a natural nitrogen source for her soil.

Stay tuned for more updates on Sara's progress in future newsletters! Funding for her cover crops was in part provided through the county's soil health cost share program.

Interested in soil health cost share or learning more? Fill out our online interest form and our staff will contact you.

Update on DIY native plant milk jug experiment

Here's an update from Hennepin County's Roz Davis on her DIY native plant experiment.



If you saw the last newsletter, you might remember Roz's experiment with using milk jugs to winter-sow native plants. She planted two sets

of brown-eyed susan, purple coneflower, butterfly milkweed, and bergamot (bee balm) in recycled milk jugs using these instructions from Blue Thumb.

So far, she hasn't seen any seedlings sprout. This could be due to many different things, but she is guessing that the incredibly abnormal winter weather played the biggest part. The high temperatures in January might have given some of the seeds a false start, and the cold snap that followed could have killed some off. It's also been a super dry winter so they might not have gotten as much moisture as they needed.

Admittedly Roz is a bit sad that nothing's sprouted yet, but her biggest takeaway from this experiment has been patience! It can take a while to get the hang of native plants (especially as a newer gardener), but the experience she is getting through trial and error will help her through the second or even third tries. She will update us in the July newsletter if there are any late bloomers.

Creature feature

Nature's pollinator workforce: Hennepin County's tiniest labor force clocking in!

A rusty-patched bumblebee spotted by Hennepin County's Nicole Witzel and Tiara Burton.

As the days grow longer and temperatures heat up, pollinators are beginning to emerge from hollow plant stems, underneath the leaf litter, and underground. Awakening from their winter slumber, they will begin the vital work of pollination

that helps provide the crops we rely on every day. However, populations of bees, moths, butterflies, and other creatures responsible for transporting pollen are in rapid decline. Here are some ways you can help:

- **Create pollinator habitat on your land.** Studies have shown that farms closer to natural habitat areas produce higher crop yields due to the higher presence of pollinators. Homeowners can create pollinator habitat in their yards, too! Consider converting all or part of your lawn into pollinator habitat. Read this article to learn how.
- **Plant a variety of native plants that are attractive to pollinators.** See Blue Thumb's website for more information about creating pollinator habitat.
- **Limit pesticide use, especially during times when pollinators are active.** Some researchers have even found that increased bug diversity in your garden allows the natural enemies of pests, like aphids and mealybugs, to keep them in check. See the Department of Agriculture's website for best practices for pesticide use.
- **Consider constructing a bee house in your garden.** The tubes mimic hollow stems that bees use to house their young. See the University of Minnesota's website for ideas on creating nesting habitat.

Pollinators provide us an essential ecosystem service through their transport of pollen, and we owe it to them to protect them. Contact tiara.burton@hennepin.us for questions, comments, or pollinator success stories you'd like to share.

hennepin.us/environment
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